

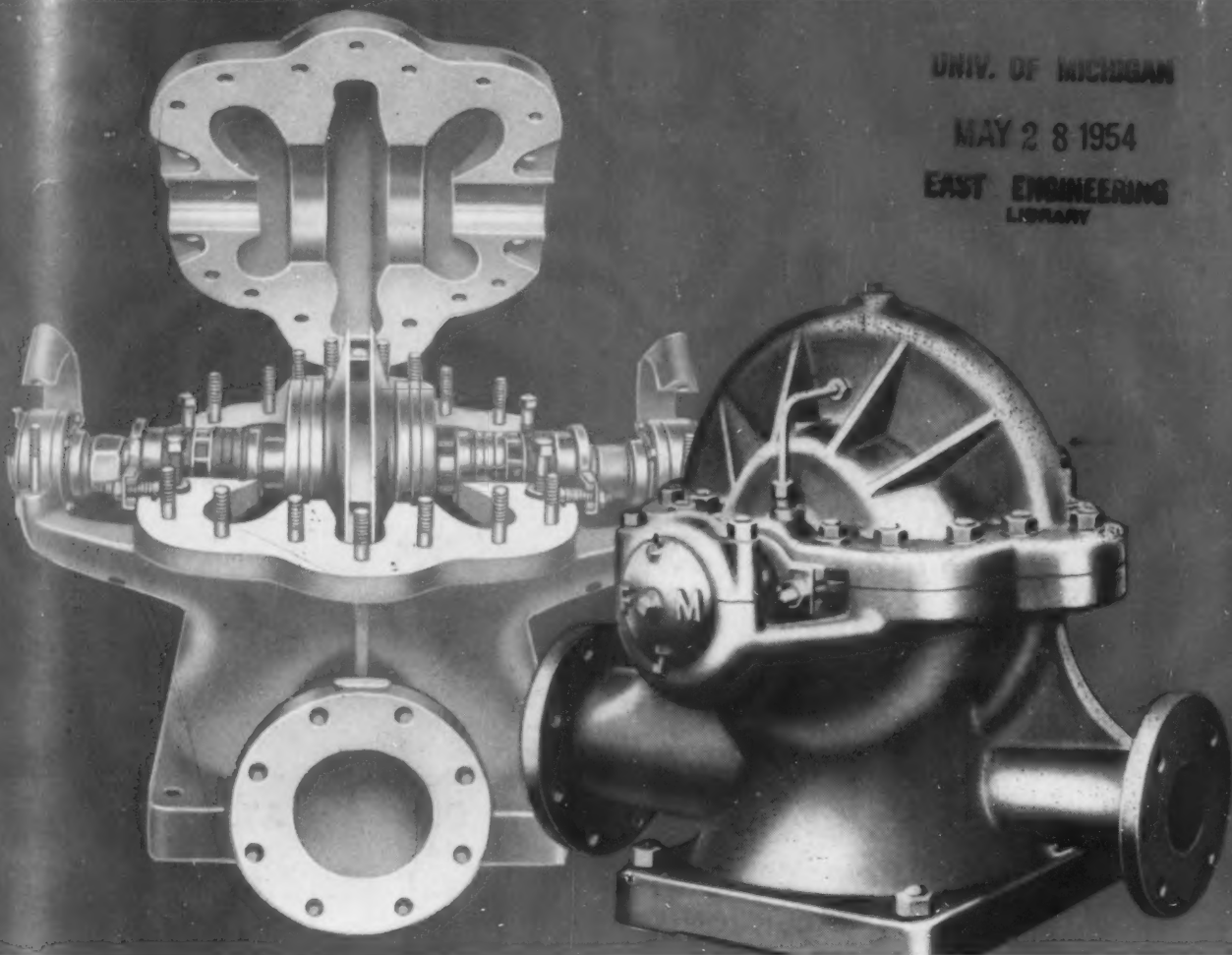
# The Iron Age

A CHILTON PUBLICATION

NATIONAL METALWORKING WEEKLY

May 27, 1954

CONTENTS PAGE 2



## out of the mouth of a pump...

Suppose a pump could "spill its works" . . . tell you how it was made . . . speak of the design, material, workmanship that went into its being . . . then you could know . . . and buy with confidence.

Because after all, pumps do look very much alike. How, then, to tell which make is best for you. *Reputa-*

*tion* is one way, *performance* another.

And, on both counts, Fairbanks-Morse pumps stand out. Don't take our word for it. Check with Fairbanks-Morse users. We'll stand by their verdict. For Fairbanks-Morse has only one standard . . . *quality* . . . the quality that means dependability, service, low maintenance, all

those important points that you want in the pumps you buy.

To get these advantages in your pumps, rely on the world's largest manufacturer of a complete pump line. See your nearest Fairbanks-Morse Branch, pump dealer, or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.



### FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

# NEW! ROTOR AIR GRINDERS

**LIGHTER!**  
**MORE POWER!**


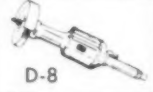
**Rotor "D-6"** ... the new, light-weight (9¼ lbs.) tool for heavy-duty work

**Rotor "D-8"** ... all the power you can use and weighs only 12¼ lbs.



ASK FOR  
BULLETINS NO. 45  
and NO. 46

## SPECIFICATIONS

	RPM	WEIGHT*	LENGTH†	WHEEL SIZE
 D-6	6000	9¼ lbs.	22¼"	6" elastic
	4500			8" elastic
	4100			8" elastic
 D-8	6000	12¼ lbs.	21¾"	6" elastic
	4500			8" elastic
	4100			8" elastic

\*For straight handle. For grip handle add ¾ lbs.

†Deduct 1½" for grip handle.



THE **ROTOR TOOL** CO.  
CLEVELAND, OHIO



UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS





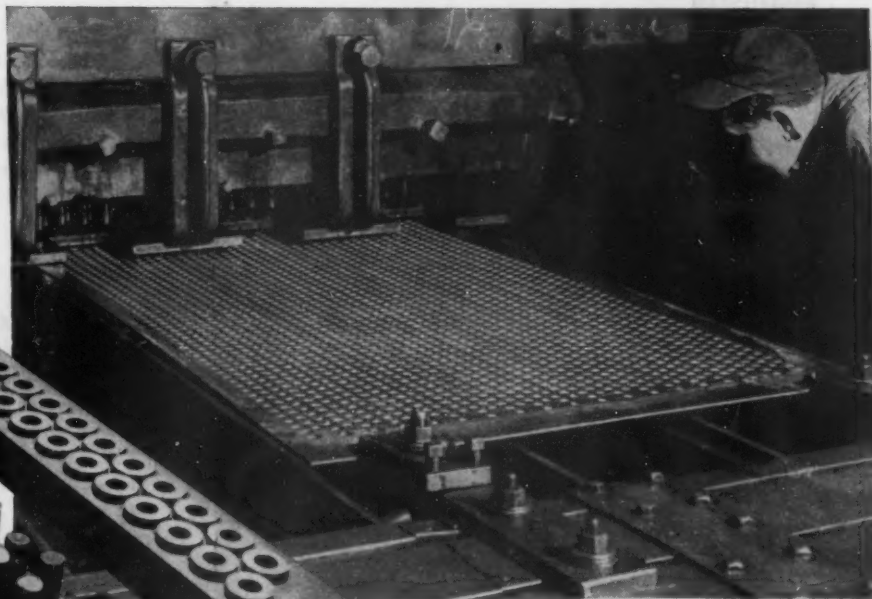
# Tool Steel Topics



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

The Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

BTR Die can simultaneously punch 39 holes 3/16 in. in diameter in 36-in. carbon-steel plate as it stamps screen segment for coal producer.



Closeup of punch holder and bottom die. BTR, an old favorite of Remaly Manufacturing Co., Inc., has had long use in their shop.

## BETHLEHEM TOOL STEEL ENGINEER SAYS:



*Don't Punch All the Way Through*

The tool life of punches can be greatly improved by proper control of the stroke of the punch. It is not necessary for a punch to go completely through the hole being punched, for when it does, rapid wear occurs. The wear increases clearance, which in turn increases the load necessary for punching and also results in burred edges.

When a punch has penetrated part way through the stock, "snapping" occurs and the "button" pops out. How far the punch penetrates before snapping takes place depends upon the material being punched and the thickness of the stock. Generally, the softer the material the greater the penetration required. Conversely, a hard or brittle material requires less penetration.

Penetration on soft, thin stock may be as high as 90 pct of the stock thickness, and on hard, thick stock, as low as 40 pct. The less penetration required to bring out the button, the better. What the penetration should be must be determined empirically on each job. Control of punch penetration by adjusting the press stroke means decreased punch-wear, better quality parts and increased tool life.

## Dies made of BTR take big bites in making screens for coal producer

It's interesting to watch some of the operations performed in the shop of the Remaly Manufacturing Co., Inc., Tamaqua, Pa. For example, here's a typical job handled by this 90-year-old firm. They set up a punch holder and dies in a 900-ton press, feed in 6-gage carbon steel plate, or sometimes stainless, or manganese-bronze. Then, Boom! Boom! Boom! In less time than it takes to tell, they've punched a large screen segment for use in sizing anthracite coal.

What steel do they use for the dies? It's Bethlehem BTR, an old standby with Remaly. One day we asked them what they liked best about BTR for making screen segments. Wear-resistance? Shock-resistance? Low distortion? Good machinability? Fast, easy heat-treatment?

"It's hard to put a finger on any one of those points and say it's best," answered Bill Yost, one of the heads of the firm. "In our shop, we like BTR on all counts. It stands up well. In fact, I can't remember ever having trouble with it."

BTR (Bethlehem Tool Room) is our general purpose, manganese-chromium-tungsten grade of oil-hardening tool steel. Its outstanding characteristic is its safe-hardening property. It has the happy combination of abrasion-resistance and toughness, making it an ideal steel for tool-and-die applications where long wear is essential.

Your nearest Bethlehem tool steel distributor has a good stock of BTR on hand and is at your service. Give him a call at your first opportunity.

# The Iron Age

Vol. 173, No. 21, May 27, 1954

\*Starred items are digested at the right.

## EDITORIAL

Old Mother Government ..... 7

## NEWS OF INDUSTRY

- \*Special Report: How Industry Views Seaway... 69
- \*Interview: Seaway Assures Iron Ore Supply... 72
- \*Labor: Steel Union Shoots for Moon... 73
- \*Communications: Plant TV Shows Big Gains... 76
- Controls: Civilians to Get Some Titanium... 78
- \*Production: Heavy Press Starts Production... 79
- \*Oxygen Rights Go to Kaiser... 81
- Manufacturing: New Locknuts Reduce Weight... 82
- Industrial Briefs... 88
- Personnel: Iron Age Salutes... 103
- Iron Age Introduces... 105
- Clearing House... 182

## NEWS ANALYSIS

- Newsfront... 67
- \*Report to Management... 87
- \*Automotive Assembly Line... 90
- \*This Week in Washington... 95
- West Coast Report... 99
- \*Machine Tool High Spots... 101

## TECHNICAL ARTICLES

- \*Production Mill Rolls Wide Magnesium Flats... 111
- \*Generators Centralized to Improve Layout... 115
- \*Inert Gas Gives Titanium Tubing Weld Backing... 118
- \*Gear Inspection Key to Better Performance... 120
- \*Comic Film Helps Cut Careless Handling... 126
- Technical Briefs... 138

## MARKETS & PRICES

- The Iron Age Summary—Steel Outlook... 161
- \*Steel Product Markets... 163
- Nonferrous Markets... 164
- Iron and Steel Scrap Markets... 168
- Comparison of Prices... 172
- Steel Prices... 174

## REGULAR DEPARTMENTS

- Dear Editor... 9
- Fatigue Cracks... 11
- Dates to Remember... 13
- Free Literature... 130
- New Equipment... 145

## INDEX OF ADVERTISERS

190

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Address mail to 100 E. 42 St., N. Y. 17, N. Y.

# DIGEST of

## NEWS DEVELOPMENTS

### WHAT INDUSTRY THINKS ABOUT THE SEAWAY—P. 69

Approval of the St. Lawrence Seaway has created a lot of talk, but so far the contemplated 6-year development period has instilled a lot of caution. Exporters will gain freight advantage. Detroit expects annual million-ton export-import volume within 5 years after completion.

### SEAWAY ASSURES FUTURE IRON ORE SUPPLY — P. 72

In an exclusive IRON AGE interview, Ernest T. Weir, National Steel Corp. board chairman, tells what the St. Lawrence Seaway will mean to the steel industry. It's a natural highway for Labrador ore import and will guarantee the ore supply for inland mills. No direct effect on steel marketing pattern.

### USW AIMS HIGH, COMPROMISE EXPECTED — P. 73

Steel industry's reaction to '54 contract demands: They sound more like long-range goals than immediate objectives. It's the old union stratagem—Ask for the moon and even a compromise will look good. Program is so all-inclusive that a cost estimate is virtually impossible at this time.

### INDUSTRIAL TELEVISION SHOWS BIG GAINS — P. 74

Closed circuit TV is playing to an ever-growing industrial audience as the camera is checking up on processes ranging from under water construction to jet engine flames. Equipment producers netted \$3 million last year, expect to hit \$10 million within 2 years. Aim at further price cuts.

### SHIFT HEAVY PRESS TO PRODUCTION RUNS — P. 79

Alcoa has shifted from test to regular runs on the 14,000-ton extrusion press built under the Air Force heavy press program. The unit can extrude aircraft parts up to 110 ft long, 2500 lb in weight. Higher pressures permit thinner wall sections. Parts can be made lighter, and output is quicker, cheaper.

### KAISER GETS RIGHTS TO BRASSERT PROCESS — P. 81

Exclusive U. S. rights to design, construct and license the European-developed oxygen bessemer process were acquired last week by Kaiser Engineers. Claim \$3 per ton cheaper production cost, lower installation cost compared to openhearth. Say 70 to 80 pct of bessemer could be converted.

# of the Week in Metalworking

## ENGINEERING & PRODUCTION

**— P. 69**  
created a  
r develop-  
Exporters  
its annual  
ears after  
**HOW MILL ROLLS WIDE MAGNESIUM FLATS — P. 111**  
Bridging the gap between handmill rolling by Dow Chemical Co. of comparatively small sheets and plates and rolling big magnesium plates and coils up to 84 in. has involved development of rolling equipment having unusual flexibility. Multi-million dollar investment backs the future of magnesium.

**— P. 72**  
T. Weir,  
what the  
industry,  
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ills. No  
**CENTRALIZED GENERATORS CAN CUT COST — P. 115**  
Making best productive use of all available production area through better plant layout is a long range cost saver. Bingham-Herbrand recently took a step in this direction by centralizing atmosphere generators in a separate "gas house" to serve both forging and heat treating furnaces.

**— P. 73**  
eds: They  
ate objec-  
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possible  
**INERT GAS GIVES TITANIUM PROTECTION — P. 118**  
Thin-walled titanium tubular assemblies are being welded successfully, using an inert gas inside of intricately shaped sections to prevent atmospheric contamination. This technique, which effectively overcomes the problem of embrittlement, is used for nonstructural aircraft parts.

**— P. 76**  
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\$3 mil-  
2 years.  
**LOWER COST IN GEARS AIDS PRODUCTION—P. 120**  
Lower costs in gear production, through better control of the production cycle, are possible where inspection methods are best suited to production process and use requirements. Selection of most economical methods depends largely on method of manufacture and type of gear produced.

**— P. 79**  
on the  
r Force  
aircraft  
Higher  
can be  
**COMIC'S ANTICS AMUSE PLANT WORKERS—P. 126**  
The average American worker likes comic characters and new automobiles. He'll laugh at one; respect the cost of the other. Show him a "knucklehead" bungling around a plant and damaging precision parts as expensive as a new car. The worker will laugh, but he'll get the point.

**— P. 81**  
license  
as were  
\$3 per  
on cost  
ssmers  
**NEXT WEEK—CLOSING METHODS CUT CASTING COSTS**  
New methods of closing and securing shell molds are rapidly being developed to improve quality of shell mold casting. Dimensional accuracy is more easily maintained and runouts have been reduced. A thermoplastic resin wood glue has been used successfully for rapid closing of shells.

## MARKETS & PRICES

**HOW ASIAN POLICY WILL AFFECT ECONOMY—P. 87**  
If U. S. decides to take strong stand in Southeast Asia the effect on the economy shouldn't be as violent as when we went into Korea. The economy could take it in stride. But consumers and manufacturers may strip the gears if they get scared and start buying way above their actual needs.

**PACKARD, STUDEBAKER MAY MERGE SOON — P. 90**  
Time may be the important factor in linking together Packard and Studebaker. The announcement may be expected either in the very near future—or not for several years. Reason for the importance of time is that Packard is at a crossroads and must choose one path or the other. Studebaker still mum.

**SEE MODERATE DEFENSE SPENDING INCREASE — P. 95**  
A fighting war, as far as the U. S. is concerned, isn't in the cards this year. But the build-up in armed defenses is to continue—both at home and abroad. Downtrend of contract letting is ended, open-end contracts may be stepped up, and Air Force buying is expected to start climbing.

**TOOL BUILDERS HAWKEYE SURPLUS SALES — P. 101**  
Prospective machine tool buyers, hopefully scanning government surplus lists for post-Korean bargains, are apt to be disappointed. There'll be no flood like the one following World War II. Auctioning of the late 40's dissipated reserves, forced tool builders to retrench all along the line.

---

### Steel Product Markets—P 163.

This week THE IRON AGE is introducing a new regular feature. Steel Product Markets gives you, at a glance, an up-to-the-minute report on market conditions prevailing in each major steel mill product.

Written in Pittsburgh, it includes information gathered by IRON AGE editors in other major centers so you can see how local markets are faring as well as the overall national scene. If you're a purchasing agent, this is must reading for you.

---





## STARTING POINT for good centrifugal castings

All good casting starts in the melt with more accurate control of temperature and closer control of chemical composition. These are both *inherent advantages* of Ajax-Northrup High Frequency, Hi-Speed Induction Furnaces.

Accurate analysis is simply achieved and continuously maintained by fast melting . . . with practically no chance for oxidation. Alloying is easy because losses are negligible . . . you get out what you put in. And, even with elements of widely dissimilar densities, you pour metal of uniform composition since the melt is constantly, thoroughly stirred by electromagnetic action inherent to the furnace principle.

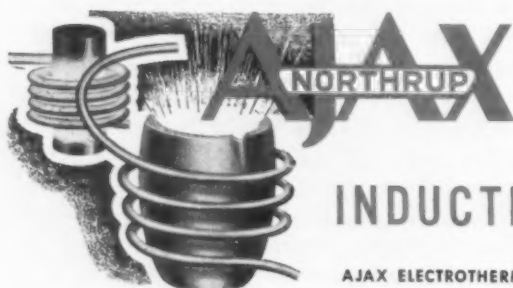
In actual production with an Ajax-Northrup Fur-

nace, alloying elements can be controlled usually within 0.25%; carbon within 0.01 or 0.02%. Melts can be reproduced . . . each time with identical composition . . . or alloys may be varied quickly. Pouring temperature, especially important in centrifugal and precision casting, may be maintained exactly as desired.

Practical savings with Ajax-Northrup Hi-Speed Melting are found in the almost complete recovery of alloying elements. Savings are also realized in an overall reduction in rejects and subsequent grinding operations.

**TECHNICAL DATA AVAILABLE:** Tell us what you're melting . . . and in what quantities. We'll send you the proper bulletins.

543



SINCE 1916

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## Editorial

The Iron Age

FOUNDED 1833

## Old Mother Government

IN A well balanced family life the mother symbolizes security, love and understanding. In a practical sense she sees that things get done. She takes care of physical and mental cuts and bruises and generally protects her brood against all hazards.

Children lean on the mother for all kinds of things—many of which represent proper need for help in getting through difficult periods. This demand takes all manner of forms.

A mother who knows her business usually cuts the Gordian knot and throws her children—man or child—on their own when the right time comes. The self confidence and self reliance which follow are of the same type which blazed new trails in America in the pioneer days. Those same traits today save most of us from wallowing in self pity.

But two World Wars, a soul searing depression, the growth of a false and phony doctrine—communism—and the coming of the Hydrogen Age have played havoc with many Americans.

There has been a dangerous trend for so-called grown-ups to revert to childhood feelings of insecurity. This has led to an attempt by many to substitute government for the mother. Naturally it is not socially acceptable for grown people to be running to their mother to settle their problems. Yet it seems to be sensible to some people to ask the government to take the place that their mother occupied at one time. This desire to have someone else take over the burden shows up in apparently logical and acceptable views and projects.

Even if we allow the government—through subsidies, pensions, medical help, restrictive laws on business, improper tariffs, shaky and uneconomical loans and giveaway programs—benefits many people it can never take the place of a mother.

The government is not personal. It is the sum total of all the people. In the long run it can only pay out what it takes in. It has no capacity for love and understanding. It is cold and impersonal. To clothe it with something akin to mother characteristics is a travesty on common sense and strong character.

If Old Mother Government goes to the cupboard too often she will find it bare. Not only will there be no bone for those who leaned too heavily upon her—there won't be any for those who took care of themselves.

Tom Campbell

Editor

May 27, 1954

# Here's how to cut your casting costs . . .



Photo courtesy of METCO PROCESSING CORPORATION

Up to 50% closer dimensional tolerance  
 . . . 60% less time . . . 14% increase in  
 metal yield . . . 300% increase in produc-  
 tion rate . . . 25% less initial plant cost  
 . . . 80% reduction in machining opera-  
 tions . . . these are some of the almost  
 unbelievable gains being made in some of  
 the nation's leading foundries by the shell  
 molding process.

Experienced foundry men know that  
 the quality of the resin has a great deal  
 to do with the degree of savings achieved  
 with shell molding. This is why more  
 foundries are specifying Monsanto Resinox  
 shell molding resins as the shortest and  
 most profitable road to castings with better  
 surface finish, greater uniformity, much  
 lower reject rate, more accurate dimen-  
 sions and lower cost. Resinox shell mold-  
 ing resins, like all Monsanto foundry resins,  
 are research-proved and shop-tested under  
 actual foundry conditions. They are de-  
 signed to meet your production require-  
 ments.

In addition to Resinox shell molding  
 resins, Monsanto supplies phenolic and  
 Resimene urea resins for core binding, and  
 Lytron sand conditioner for conventional  
 sand casting. For complete information,  
 mail the handy coupon today.

Resinox: Reg. U. S. Pat. Off.

• • • • •  
 MONSANTO CHEMICAL COMPANY, Plastics Division, Room 5905, Springfield 2, Mass.

Please send me complete information on:

. . . Resinox shell molding resins; . . . Monsanto phenolic resins; . . . Monsanto core binding  
 resins; . . . Lytron sand conditioner.

Name & Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City, Zone, State \_\_\_\_\_



SERVING INDUSTRY . . . WHICH SERVES MANKIND



# Dear Editor:

## Letters from readers

### Thank You

Sir:

Our association is a subscriber to your publication and I wish to congratulate you upon the very interesting and helpful articles you publish.

Our association issues a monthly News Letter and I am requesting permission to reprint excerpts from some of the articles in your magazine, giving you credit for same. Have I your permission to do this?

LOUIS D. GORDON

Nevada Mining Assn., Inc.  
Reno, Nev.

You certainly do have our permission to reprint excerpts from our articles.—Ed.

### Air Compressor

Sir:

Will you please have complete information sent to us regarding the rotary type air compressor which you described on p. 131 of the May 13 issue.

JOHN DRAZICK  
President

Northeastern Tool & Die Corp.  
Detroit

More detailed information may be obtained from the Davey Compressor Co., 600 Franklin Ave., Kent, Ohio.—Ed.

### Chip Breaker

Sir:

My compliments for the way in which you have extracted the basic facts of chip flow and chip breaking from my book and presented them in a condensed form without sacrificing clarity and logic.

I would appreciate two favors from you:

(1) Would you kindly send me a few sets of tear sheets of the pages with the chip breaker article (pp. 104, 105, 106, Apr. 29 issue).

(2) Would you kindly correct the statement about Cornell University. I left Cornell almost one year ago and I am now associated with the University of Missouri, Department of Mechanical Engineering, in charge of Machine Tool Laboratory.

If desired, could I or the university get reprints of this article?

ERIK K. HENRIKSEN

University of Missouri  
Columbia, Mo.

### Uniterm Indexing

Sir:

Please send us further information on the Uniterm Coordinate Indexing

system which was mentioned in the Newsfront of the Nov. 5, 1953 issue.

R. CRAFOORD  
Librarian

Ab Svenska Metallverken  
Vasteras, Sweden

Further information on the system's installation and use is contained in a manual entitled "Installation Manual for the Uniterm System of Coordinate Indexing." It was prepared by Documentation Inc. under Contract AF 18 (600)-376 and published by Document Service Center, Knott Bldg., Dayton 2, Ohio. A copy may be obtained by writing to the Armed Services Technical Information Agency, Lafayette Bldg., Washington 25, D. C.

The book "Studies in Coordinate Indexing" by Mortimer Taube & Associates, published by Documentation Inc., 2521 Connecticut Ave., N.W., Washington, D. C., gives a full description of the Uniterm system theory.—Ed.

### Vibrations Mine Coal

Sir:

In the May 6 issue, we noticed an article in which Konnerth automatic coal mining equipment was mentioned and illustrated.

We desire to contact the manufacturer and would appreciate it if you will give us the company's name and address.

ROBERT L. ZIEGLER

Asahi New York, Inc.  
New York

This vibration process was developed by K. L. Konnerth, vice-president, U. S. Steel Corp., 71 Broadway, New York, who can supply you with further information.—Ed.

### Titanium Machinability

Sir:

I read with interest the series of articles "How Does Titanium Machine", published in the issues of Jan. 21, 28 and Feb. 4.

If copies of these articles are available, I would certainly appreciate having two sets.

ROBERT F. TERTOCHA

Sinclair Refining Co.  
Chicago

### Intergranular Corrosion

Sir:

We would appreciate receiving 25 reprints of the article "Low Carbon Stainless Resists Intergranular Corrosion" from the May 6 issue of your magazine.

H. C. WOOD  
Engineer

Bristol Metal Products Corp.  
Bristol, Tenn.



## CUT BAR STOCK up to 5/8" Diameter

Accurately, Instantly with  
a DI-ACRO\* ROD PARTER

The shearing-breaking action of a Di-Acro Rod Parter allows most bar stock to be cut without burr and distortion. After parting, the bar is easily inserted into a hole its same diameter and the end can be threaded or riveted without further processing.

Holes in cutting heads accommodate eleven different round stock sizes. Also special heads for cutting square, and other shaped bars.

### BOTH HAND AND POWER MODELS AVAILABLE

Instantaneous cutting action with Di-Acro Power Rod Parter. Rate of production is limited only by speed with which stock can be fed. Motor driven flywheel, other moving parts housed in welded, steel cabinet.

\*pronounced Die-ack-ro



Like More Information? . . . Send for  
32-Page Catalog



Gives complete details on hand and power operated Di-Acro Rod Parters, Benders, Brakes, Notchers, Punch Presses, Rollers and Shears.

Creators of  
"DIE-LESS DUPLICATING"

O'NEIL-IRWIN  
MFG. COMPANY  
302 Eighth Ave.  
LAKE CITY, MINN.

**di-acro**  
PRECISION  
METALWORKING  
MACHINES

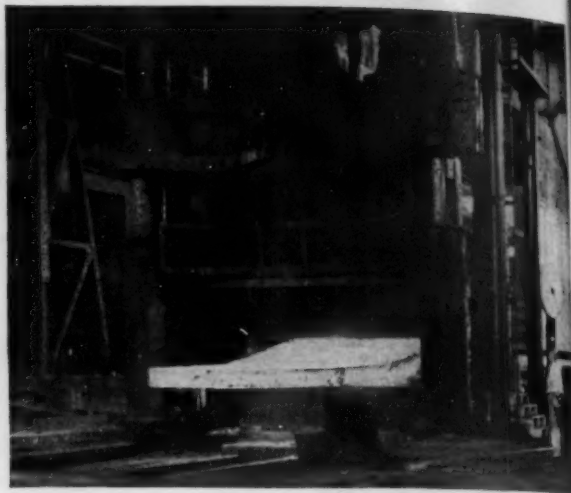
May 27, 1954

# ON THE BEAM FOR AIRPOWER



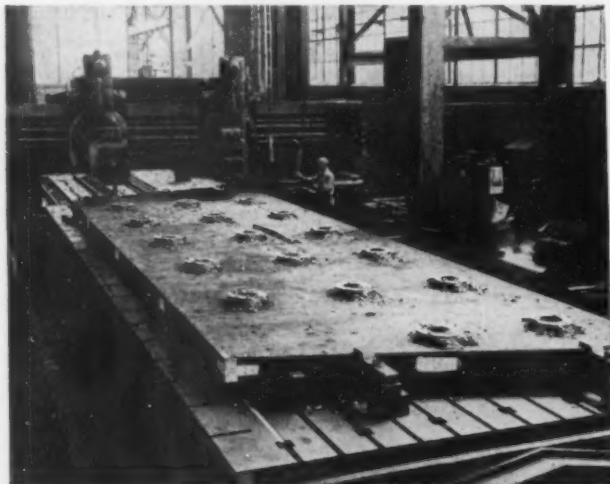
## POURING 405,000 POUND INGOT

... required heats from two open-hearth furnaces, each of 100 ton capacity. This was the first step by Midvale in making support beams for new Loewy-Hydropress designed and built 50,000 ton press for the Air Force heavy press program.



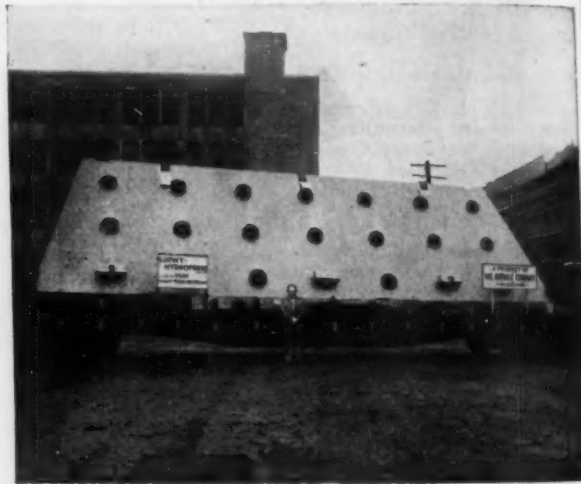
## FORGING ON 14,000 TON PRESS

... to reduce 68 inch by 154 inch ingot to rough size and shape. Heat treated in temperature controlled furnaces to required physical properties ... to withstand the stresses of tremendous pressures.



## MACHINING 12' x 40' SUPPORT BEAM

... finish machining the faces of spacers on a large planer to assure close dimensions and fit with eleven other support beams which make up the head of this 50,000 ton press. Midvale machine tools are capable of handling rough and finish machining operations on all size products ... large and small.



## READY FOR ASSEMBLING

... beam is loaded on flat car for shipment. This is only one of 42 parts of similar design produced by Midvale for this press. Midvale was chosen by Loewy-Hydropress, Inc. for its complete facilities for forging, annealing, welding, stress relieving and finish machining. Why not use these facilities for your products?

**THE MIDVALE COMPANY-Nicetown, Philadelphia 40, Pa.**

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

# MIDVALE

FORGINGS, ROLLS, RINGS, FLANGES, STAINLESS STEEL CASTINGS



# Fatigue Cracks

by William M. Coffey

## Like Father . . .

At the unanimous request of two of our vast number of readers, today we continue with our Family Life series about our daughter Pat, 6 years old. Schools have what they call Parent Teachers Associations where the parents and the teachers associate. We always associate to the best of our ability with Pat's teacher, even though our parental pride is regularly punctured. Generally it's been "Pat's a cute little thing, but she must stop giggling and pay more attention. Forget about Ricky Smith and get on with her adding." So even though we fulfill our community duty, it's not always fun.

Last week's "Open House", however, was different. We approached this meeting secure in the knowledge that for once we could look the teacher in the eye and say "We're Pat's father" and mean it. We'd been elated all week because Pat had convinced us that she was doing a terrific job, turned over a new leaf, dropped her frivolous ways. Pat had received a "STAR" for good citizenship! Our little Pat, out of all the pupils in her class! This had been the talk of the house all week. Pat proudly told us to look at the bulletin board first thing, and see her STAR.

We did this, first thing. The bulletin board was titled "TEACHERS LITTLE HELPERS FOR THIS WEEK" and read like this:

Janie Richmond \* \* \* \* \*  
Billy Cosgrove \* \* \* \* \*  
Sarah Ann Richards \* \* \* \* \*  
Mary Elinor Giardello \* \* \* \* \*  
Johnnie Rogers \* \* \* \* \*  
Peter Keenan \* \* \* \* \*  
Dorothy Ann Buck \* \* \* \* \*  
Pat Coffey \*

...like daughter.

## Letters

This one just came in from Detroit—

Pack #588  
Den #5

Dear Sir:

I am a Committeeman for Cub Scout Pack #588a and am always on the look out for ideas to keep them interested as well as to educate them.

I would like to know if you could donate your new issue of Handbook of Terms as I think it would be very interesting as well as educational.

I have a boy who is 9 years old and he came home last week and wanted help in writing a theme about steel, well he got what we needed from books I have at home and I worked for a steel company for 5 years. But still feel that book on terms would be of great help to all the boys. There are 30 in the pack.

We will be most grateful for any help you can give us. Thank you.

We sent a couple of our Handbook of Terms Commonly Used in the Steel and Nonferrous Industries . . . and took one home to Pat. Start 'em early on Base Box, Bundle, Bottle Top Mold, Blue Brittleness, Bond Blister, Brucite and the Bunch Coils we always say.

## Open Letter . . .

...to Mr. White or Mr. Young, whichever the case may be, New York Central RR.

For Pete's sake get down to Car 160, Bedroom "B" (think you call it the Buffalo City) on the Ohio Limited.

Needs oil or something. Might have a hot box there. It grunts and groans, squeaks and shakes and shivers all over—all night. Reminded us of a camel we once tried to catch a nap on.

Will vote for the guy who gets there first.

VT Yours,

## Puzzlers

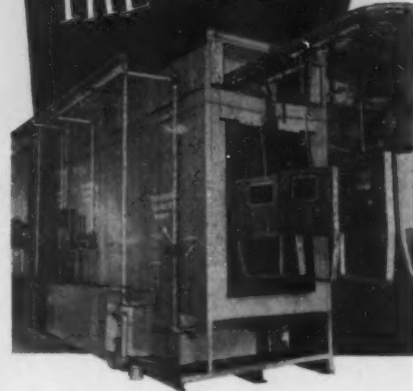
Can't think of a better answer to "our wife vs beere vs husband" puzzler (April 29) than gUSA "u"s-terlund sent us: "Waugh, for why should said husband leave his wife for anytime, as to carry-on with a cute blond? No say, has he the 7-year itch? Just to think he has for free *thirty days* to spend away from his wife for making of one vesell of beers." Winners: L. Randerson, George A. Meyers, Jr., Kenneth Hofer, Arthur B. Retallick, Helen O. Heussner, ole pal Charlsie Burch, George Kiffer, N. Holland, B. Korges, M. C. Wallis, Richard Murphy, Leo Chaite, F. Anderson.

## New Puzzler

What is the diameter of an inscribed sphere in a tetrahedron with base edges of 46.23, 49.3 and 35.2 inches respectively and lateral edges which are mutually perpendicular at the vertex?

Do a Better Job Faster . . .

cut cleaning costs  
**RIGHT DOWN  
THE LINE!**



METALWASH Phosphatizing Machine  
at the AUTOCAR DIVISION of the WHITE MOTOR CO.

**METALWASH Phosphatizing Machine**  
provides superior pre-paint surface  
at **PROVEN COST SAVINGS**

METALWASH-designed Phosphatizing Machines are available for every application from the simple phosphate-cleaner to the multi-stage wash, rinse, phosphate coat, rinse, acid rinse, and dry machines.

"... with our METALWASH Phosphatizing Machine we have achieved substantial product improvement and considerable cost saving, together with elimination of paint failures in the field," states Robert Hood, Supervisor of Mfg. Research of the Autocar Division of the White Motor Co.

**METALWASH SPRAY PICKLING MACHINE** is a production method in preparation for enameling, plating, phosphating; in removal of annealing scale after heat treatment.

**METALWASH PARTS WASHERS**, designed for alkaline-, neutral emulsion-, or solvent-type cleaners, are manufactured in five basic types.

**METALWASH VAPOR DEGREASERS** provide new speed, economy, durability.

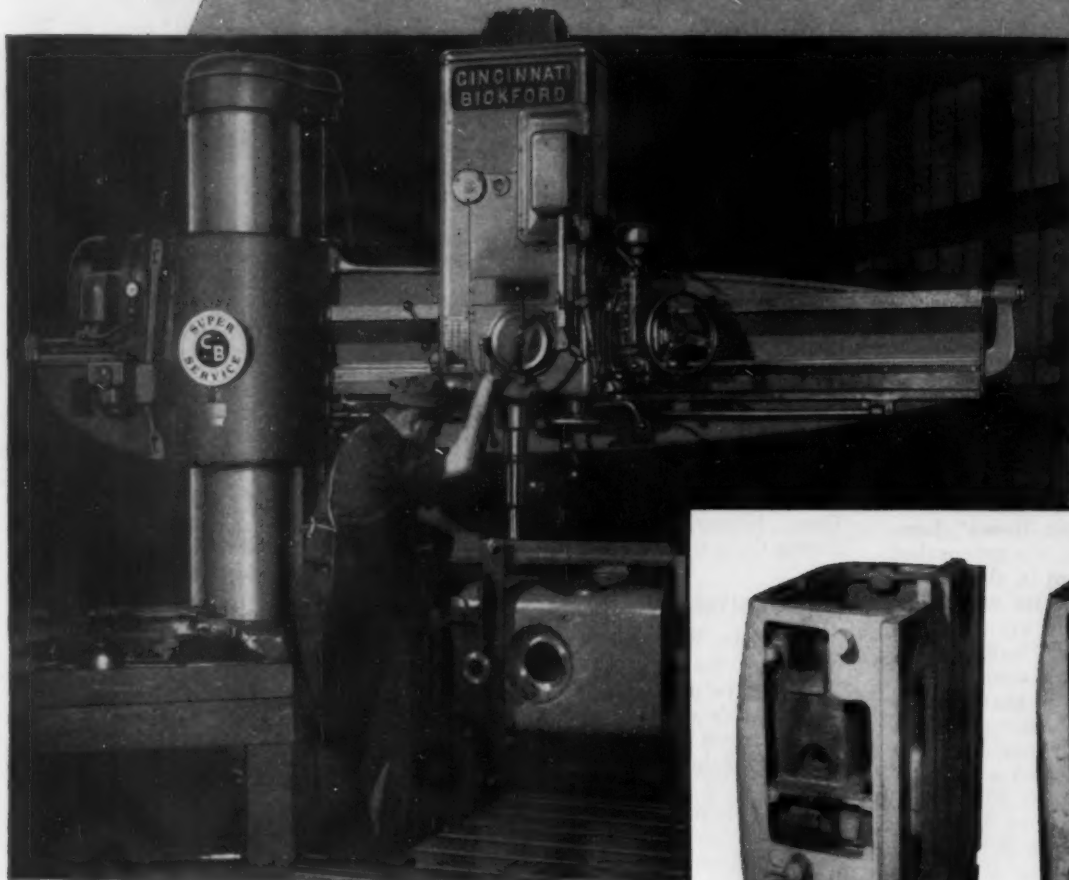


**METALWASH MACHINERY CORPORATION**  
920 North Avenue, Elizabeth 4, N. J.

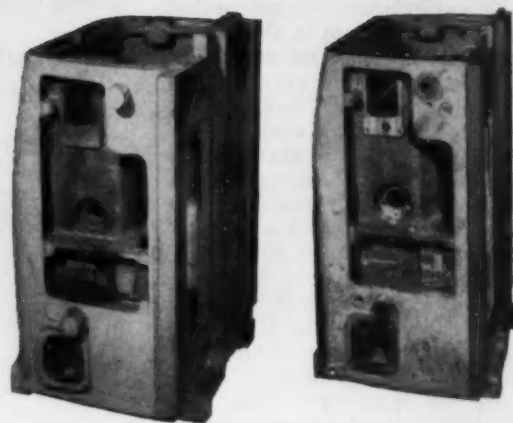
May 27, 1954



# Bickford accuracy



... HELPS BUILD  
**ACCURATE  
MACHINE  
TOOLS**



Milling Machine Knee

*Photos courtesy of the George Gorton Machine Company,  
Racine, Wisconsin*

To .0005" accuracy, this performance in drilling, reaming and boring 100 holes from 1/2" to 2 1/2" diameter to 3" deep, to this tolerance, is typical of Cincinnati Super Service Radial Drills.

Here at the George Gorton Machine Company, manufacturers of machine tools, where accuracy is necessary, ten Cincinnati Bickford machines are in use.

Write for Catalog R-29.

.... **CINCINNATI  
BICKFORD**



RADIAL AND UPRIGHT DRILLING MACHINES

**THE CINCINNATI BICKFORD TOOL CO.**

Cincinnati 9, Ohio, U.S.A.

## Dates to Remember

### Meetings

#### JUNE

**AUTOMOBILE MANUFACTURERS ASSN.**—Annual meeting, June, Detroit. Association headquarters are at 320 New Center Bldg., Detroit.

**EDISON ELECTRIC INSTITUTE**—Annual meeting, June 1-4. Institute headquarters are at 420 Lexington Ave., New York.

**AMERICAN GEAR MANUFACTURERS ASSN.**—Annual meeting, June 6-9. The Homestead, Hot Springs, Va. Association headquarters are at Empire Bldg., Pittsburgh.

**NATIONAL METAL TRADES ASSN.**—Annual Western plant management conference, June 6-12. Association headquarters are at 122 S. Michigan Ave., Chicago.

#### EXPOSITIONS

**AMERICAN SOCIETY FOR METALS**—National Metal Exposition, national metal congress, Nov. 1-5, Palmer House, Chicago. Society headquarters are at 7301 Euclid Ave., Cleveland.

**SOCIETY OF AUTOMOTIVE ENGINEERS**—Summer meeting, June 6-11, The Ambassador and Ritz-Carlton Hotels, Atlantic City, N. J. Society headquarters are at 29 W. 39th St., New York.

**AMERICAN FOUNDRYMEN'S SOCIETY**—Annual meeting, June 7, Chicago. Society headquarters are at 616 S. Michigan Ave., Chicago.

**THE INSTITUTE OF COOKING & HEATING APPLIANCE MANUFACTURERS**—Annual meeting, June 7-9, Netherland Plaza Hotel, Cincinnati. Institute headquarters are at The Shoreham Hotel, Washington, D. C.

**AMERICAN SOCIETY FOR QUALITY CONTROL**—Annual convention, June 9-11, Jefferson Hotel, St. Louis, Mo. Society headquarters are at Room 5036, 70 E. 42nd St., New York.

**CUTTING TOOL MANUFACTURERS ASSN.**—Summer meeting, June 11. Association headquarters are at 416 Penobscot Bldg., Detroit.

**MAGNESIUM ASSN.**—Summer meeting, June 9-12, Seignior Club, Quebec. Association headquarters are at 122 E. 42nd St., New York.

**AMERICAN BOILER MANUFACTURERS ASSN. & AFFILIATED INDUSTRIES**—Annual meeting, June 13-16, The Homestead, Hot Springs, Va. Association headquarters are at 1571 W. 117th St., Cleveland.

**AMERICAN SOCIETY FOR TESTING MATERIALS**—Annual meeting, June 13-18, exhibit of testing apparatus and laboratory supplies and photographic exhibit, Hotels Sherman and Morrison, Chicago. Society headquarters are at 1916 Race St., Philadelphia.

**COMPRESSED GAS ASSN., INC.**—Summer meeting, June 14-16, Seaview Country Club, Absecon, N. J. Association headquarters are at 11 W. 42nd St., New York.

**RADIO - ELECTRONICS - TELEVISION MANUFACTURERS ASSN.**—Annual convention, June 15-17, Palmer House, Chicago. Association headquarters are at 777-14th St., N.W., Washington.

**THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS**—Semi-annual meeting, June 20-24, William Penn Hotel, Pittsburgh. Society headquarters are at 29 W. 39th St., New York.

**AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS**—Summer and Pacific General Meeting, June 21-25, Los Angeles. Institute headquarters are at 33 W. 39th St., New York.

**CASTER & FLOOR TRUCK MANUFACTURERS ASSN.**—Summer meeting, June 23-25. Association headquarters are at 27 E. Monroe St., Chicago.

**AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS**—Semiannual meeting, June 28-30, New Ocean House, Swampscott, Mass. Society headquarters are at 62 Worth St., New York.

# FIRE!



## PUT IT OUT IN SECONDS

with a Kidde Portable extinguisher

Unless you get the jump on fire the minute it starts, you stand a good chance of kissing your business good-bye.

That's why it's so important to have a Kidde portable extinguisher near *every* fire hazard in your plant.

Protect motors, electrical equipment, flammable liquids and machinery with Kidde portables. Then, when fire strikes, you're ready for it.

Just grab a Kidde CO<sub>2</sub> or dry chemical portable, aim the horn, pull the trigger, and—Whoosh! No more fire!

Your *next* fire could be your *last* . . .  
Contact Kidde today!



The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

# Kidde

Walter Kidde & Company, Inc.  
549 Main Street, Belleville 9, N. J.

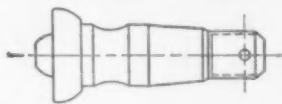
Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

# LANDIS *"Automatic"* PROVED BY PRODUCTION . . . .



## *Points and Threads 1020 Ball Studs per hour*

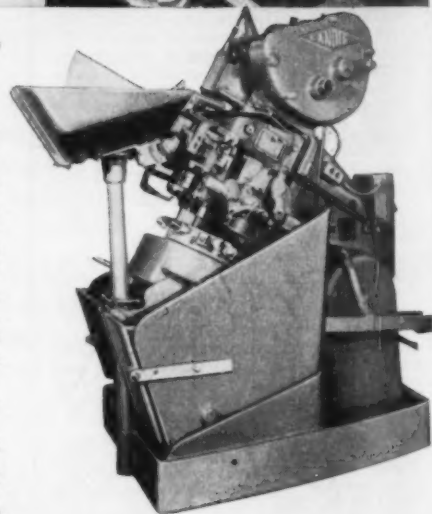
Through the use of LANDIS Automatic Forming and Threading Machines, a large manufacturer has solved his problem of mass-producing certain automotive parts.



The workpieces are cold-forged blanks, from which ball studs are made. Specifications require a 45° point and a 9/16" 18-pitch N.F. thread cut to a length of 5/8". In constant daily operation is a battery of LANDIS Automatic Forming and Threading Machines, each of which point and thread 1020 pieces per hour. Four hours of production are obtained between each chaser grinding, resulting in low tool cost and minimum machine down time.

Because of their universal features, LANDIS Automatic Forming and Threading Machines are adaptable to mass-production operations on a wide range of automotive parts. By means of pick-off speed change gears, the machine cycle can be varied to accommodate any combination of thread length, pitch, and thread diameter, within the capacity of the machine—therefore this machine is adaptable to a wide variety of work. Hopper feed and automatic operation throughout enable one operator to keep a battery of machines in constant production, while set-up changes of all types can be made in minimum time.

Can you revolutionize your pointing and threading operations with LANDIS Automatic Forming and Threading Machines? Please give specifications when writing for complete information.



# LANDIS *Machine* COMPANY • WAYNESBORO PENNSYLVANIA



## THE IRON AGE Newsfront

**ALUMINUM BRIDGE FALSEWORK** may offer the aluminum industry a major new tonnage market. One Pacific Coast construction firm will soon use 100-ton aluminum falsework sections to support a traveling crane. The crane will lift steel bridge sections from barges to an overwater bridge.

**INCREASED COMPETITION** between aluminum and steel is underscored in recent changes in base and extra prices for stainless steel sheets. Producers have their eyes on the curtain wall construction market, where aluminum has been giving stiff competition. Reductions are considerable for buyer who can process coils.

**TESTS OF AUTOMOBILE WINDSHIELDS** flown from the West Coast where pock-marking was first reported showed the marks were caused by cinders, limestone, asphalt or similar materials.

**INDUSTRIAL TV MARKET IS MUSHROOMING.** Experts close to this fast growing industry say annual sales of closed circuit systems to industry will top the \$10 million mark within 2 years. Equipment price reductions and a flood of new applications have pushed annual TV sales to industry near the \$3 million level.

**AUTOMATIC PLATING EQUIPMENT** is becoming more and more compact. In one plant 900 ft of steel rod can be plated continuously in a 30 by 6 ft shop area. Compactness has been made possible by spiraling the rod through the cleaning and plating solutions.

**TUBELESS TIRES** are expected to make substantial gains during 1954 and 1955. All major car producers are expected to offer tubeless tires on 1955 models.

**ALLOY PLATE PRODUCERS ARE FIGHTING** for a larger share of the plate market at expense of carbon steel. They have some impressive arguments including cost per unit of strength, weldability under field conditions, less weight for same strength. Increased sales here would offset losses to carbon steel in other directions.

**NEWLY FORMED AMERICAN MOTORS** is having some trouble attracting other independents into its fold. One independent politely told American it was not interested until the complex reorganization program following the Nash-Hudson merger is completed.

**MORE U. S. JET PLANE STRENGTH** is in the making. Total military planes now number about 33,000, a third of them jets. Add this: Air Force is ready to spend \$100 million a year to develop a medium bomber that will replace the swift B-47.

**MAXIMUM AUTOMATIC HANDLING** of engine heads and blocks, an auto industry trend, will be continued in Packard's tooling for its new V-8. Except for minor differences due to lower production, the line will rival any in the industry in automation.

**HEAT PROBLEMS IN JET ENGINES** have been tackled from a new angle. Now, white high-temperature enamel will be used on the outside of jet combustion chambers and black, high-temperature enamel on the inside. It's expected to drop combustion chamber operating temperatures 200° to 300°F.

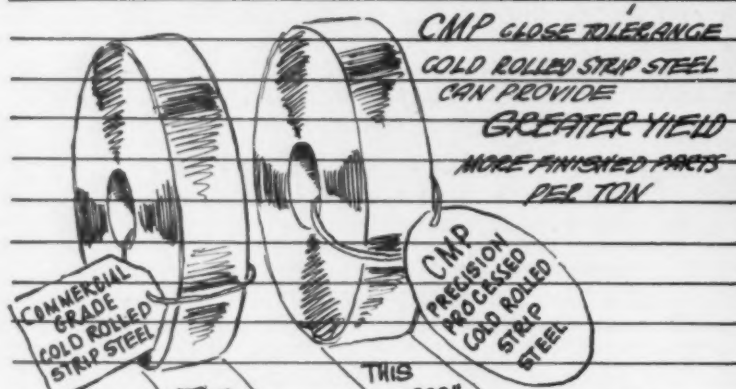
# CMP

## COLD ROLLED STRIP STEEL OFFERS

### some realistic ways . . .

*Typical Case*

1,000,000 MORE PARTS PER TON



For this manufacturer making very small items, the greater yield is an important profit advantage - Uniform gauge tolerances also mean lower fabricating costs, less wear on tools, fewer production shut downs for tool grinding.... faster assembly.

CMP CLOSE TOLERANCE COLD ROLLED STRIP STEEL CAN PROVIDE GREATER YIELD MORE FINISHED PARTS PER TON

THIS .022" COMMERCIAL TOLERANCE STRIP	THIS .022" ±.0005" CMP STRIP
YIELDS APPROX 16 MILLION FINISHED PARTS PER TON	YIELDS APPROX 17 MILLION PARTS PER TON

## TO REDUCE END-PRODUCT COSTS THROUGH PRECISION GAUGE TOLERANCES

CMP's precision rolling process permits production of cold-rolled strip steel as thin as .001" to split-hair across-the-width gauge tolerances not obtainable by other rolling methods. This unique precision is reflected in less square footage loss through oversize variation, less wear on tools, fewer rejections and faster assembly where close fitting is encountered.

CMP processes also permit close control of physical characteristics to develop the combination of physicals best suited to fabricating and service requirements of the application.

We'll be happy to work with you to develop specifications and processing methods to enable you to make the best possible product at the lowest possible cost.



## the Cold Metal Products co.

GENERAL OFFICES: YOUNGSTOWN 1, OHIO  
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LOW CARBON, HIGH CARBON (Annealed or Tempered), STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:  
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Phones: N. Y., Cortlandt 7-2427; N. J., Unionville 2-6900  
PRECISION STEEL WAREHOUSE, INC.  
4425 W. Kinzie, Chicago Phone: Columbus 1-2700



MAP OF St. Lawrence Seaway shows where channel must be dredged to 27 ft level.

## SEAWAY: Industry Watching, Waiting

**St. Lawrence Seaway project met with controlled enthusiasm . . . Many problems to be solved before full potential is realized . . . Steel mills cautious—Staff Report.**

Everybody agrees it's a good idea, but no plant owners are ripping up their rail spur tracks in anticipation of the St. Lawrence Seaway. Reaction to the project in industrial centers around the Great Lakes is approving but conservative.

Approval of the project has created a great deal of talk, but so far the contemplated 6-year development period has instilled a lot of caution. Even the most rabid Seaway advocates aren't willing to jump immediately from philosophy to economics.

Companies who do considerable exporting acknowledge immediately the advantages of a heavy-vessel sea route which would permit large vessels to load at Great Lakes docks for direct shipment to foreign ports. All-water transport

would mean a lower freight rate, and consequent lower delivered prices of heavy equipment to foreign consumers, whether the equipment producer pays the freight or his customer.

### Big Boost For Detroit

Detroit is a good example of import-export potential for Lakes cities. In 1953 Detroit handled only about 100 ocean ships, unloading 130,501 tons of cargo and loading only 18,514 tons for export.

But 5 years after the Seaway is completed, optimists predict a cargo volume of more than 1 million tons in export-import traffic for Detroit. The small ships that now average about 258 ft in length and 2500 cargo tons will be replaced by standard-sized ships up to 10,000 tons.

The so-called unfavorable balance of trade indicated by the tonnage of imports against exports would also be equalized or even reversed if the Seaway assumes its anticipated potential.

In the Midwest, Detroit is in the heart of an area which exports many diversified products to Europe. Its automobiles, machine tools, machinery of many kinds, appliances and manufactured products could logically be exported through the Seaway.

As an importing city, Detroit is a general cargo city although in 1953, 85,143 tons of steel, imported because of the steel shortage, accounted for most of the tonnage.

A survey by the Port of Detroit Commission on comparable shipping costs shows that Seaway shipping of automobiles saves \$20 to \$25 per car on freight costs to a North European port compared to shipping first by rail to an East Coast port.

A shipment of a carload of re-



frigerators would save \$114 per carload and small machines \$262 per carload.

However, shipping authorities point out that these savings in shipping costs alone constitute only part of the savings to a shipper. The advantages in direct shipping from a nearby point are obvious in the comparatively less red tape and detail, more direct control, as well as the fewer times of handling the shipped product.

On the other hand, export poses tough problems in financing, dollar exchange, foreign tariffs, and foreign trade regulations. The Seaway alone can't solve all these.

Steel companies, seemingly the first to be affected, aren't making any decided moves as a direct result of the Seaway announcement.

### Boon For Labrador Ore

From standpoint of long-range ore supply, Seaway would tend to consolidate position of established steel centers such as Pittsburgh, Cleveland, Buffalo, Youngstown, and preclude any shift to other locations for that specific reason.

According to one ore expert the Seaway will make it possible to bring Labrador ore into Pittsburgh at practically the same delivered price as that of Mesabi. This question, though, probably will hinge on toll charges for passage through the various locks.

Rail freight charges from Lake Erie ports would be about the same.

Another factor is the advantage of Labrador ore over Mesabi ore from standpoint of iron content. Mesabi ranges from about 49.07 to 63.2 pct Fe including beneficiated pellets, but average content is about 51.50 pct. Labrador ore runs about 58 pct Fe.

Obviously, for those depending on Labrador as a source the Seaway will be a great help since it will eliminate the long haul along the Atlantic Coast for docking either at Philadelphia or Baltimore for transshipment by rail.

Mills on Lake Michigan can bring in ore from Mesabi cheaper than they will be able to from Labrador even with the Seaway. So Chicago mills, for instance, will be inclined to depend on Mesabi, all other things being equal, as long as possible.

And Chicago sources point out that the Mesabi still has considerable years to run, and the Lake Superior taconite developments are still in their infancy. With taconite developments now rapidly passing the pilot plant stage, mills foresee highly concentrated ore coming from nearby Lake Superior as a hedge against heavy shipments of foreign ore into the Chicago area.

Detroit will benefit directly by the Seaway in Labrador ore for

its steelmaking facilities. Detroit's Great Lakes Steel Corp. is a subsidiary of National Steel, one of the backers of the Iron Ore Co. of Canada.

As a route for ore from Africa and South America for midwestern mills, some observers doubt that the Seaway would be feasible. Most important reason cited is that the channel will be only 27 ft. This would necessitate transshipment from ocean carriers with heavy draft to vessels of shallow draft for trip through the Seaway.

From the steel marketing standpoint, the Seaway might enable mills in Chicago, Cleveland, Detroit, Buffalo, etc., to be more competitive at such points as Maine, Boston, New Hampshire and possibly New York. It's also possible that Pittsburgh mills could reach the East Coast more cheaply and compete on at least some products. But leading eastern producers have indicated they're not particularly frightened at the prospect. And most Great Lakes producers say privately they don't expect to see any great increase in all-water shipments of finished steel.

### Study Freight Rates

But the industry does expect considerable increase in exports to Europe, South America and other foreign countries. As for shipments to Canada, one steel marketing expert points out that Canadian steel consuming areas are largely at Montreal or west of it, so the Seaway would be of no particular advantage.

Meantime, the steel mills, like everyone else along the Seaway, are busily studying freight rates.

Plate fabricators particularly like the Seaway, as it means they will be able to move heavy fabricated parts for foreign shipment easily. But even they speak with tempered enthusiasm. Every fabricated item, they point out, is a law unto itself. Freight may not be of prime importance in a delicately fabricated or complicated section and rail handling might guarantee greater safety for at

### Chicago—"Strongly Tempered Enthusiasm"

Main Chicago reaction to the St. Lawrence is strongly qualified enthusiasm. It means foreign money coming directly into Chicago. It means more convenient control of shipping arrangements rather than through distant East Coast offices. It means locally handled banking.

But first, and it's a big first—they want to study freight rates. No studies have even been considered in this area, let alone begun. It means more extensive harbor facilities, which is work not begun. It means new scheduling of ports-of-call for ocean freighters and the importance of this should not be overlooked. During the dock strikes in New York, several midwestern shippers had to use New Orleans as a port of call, encountered considerable difficulty in accommodating their shipping plans to coincide with the schedules of the ocean freighting ship lines.

On the other hand, there is little or no fear that water transportation into Chicago could result in increased competition.

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least a portion of the trip. Or again, until they know what freight rate will run they are not running away with enthusiasm.

But no Lakes city is going to be a successful port, Seaway or not, unless an active promotion is made to make it a central shipping or distributing point.

For example, Max M. McCray, Detroit port director, cites a recent shipment of heavy diesel tractors that came to Detroit, although not one of them was consigned to the city. He cites it as one of the first instances in his two years as port director where Detroit was used as the distributing point for a cargo from a European country.

Mr. McCray, incidentally, is resigning this month more or less in protest against inactivity on Detroit's part to plan for suitable port facilities.

#### Wait for Appropriations

The few commercial docks in Detroit are equipped to handle only Lakes boats or Atlantic steamers of the small size now permitted in the Lakes. No expansion by private facilities is expected until the hoped for tonnage materializes. Almost all of Detroit's suitable waterfront is now taken up. Although the Port Commission has condemnation powers, the city has moved slowly.

Like all ports further up the Lakes than Toledo, Detroit must await future appropriations by Congress to take full advantage of the Seaway. For this reason, Toledo is also pushing ahead with its port activity, hoping to become the terminal of the Seaway before other ports can take full advantage of it.

A spokesman for Army Engineers estimates that the cost of deepening connecting channels to permit larger ships to reach the upper Great Lakes would be around \$60 million. About \$5 million is needed to extend 27-ft channels to Detroit.

The upbound channel in the Detroit River must be deepened from its present 21 ft to 27 ft and the downstream channel from 24 ft to 27 ft. In addition to the Detroit

### How Cleveland Views Seaway

Most Clevelanders are convinced the Seaway will prove a boon to northeastern Ohio. Most think benefits will be threefold:

1. Opening of the gateway to Labrador ore will not only increase the supply of high grade ore available to Cleveland mills but it should also serve to forge a vital defense link in the national economy. Comparison of distances from Seven Islands, foreign and coastal ports to Cleveland also indicates shipping reductions of at least 50¢ per ton will materialize.

2. Industrialists feel the Seaway will serve to draw a great many industries up along the Lake shore. Firms now established in this area also see a tremendous increase in export of light manufactured and mercantile goods. On the reverse side of the coin, imports of raw materials should create many new jobs because of required processing and handling. Outlook for heavy noninventory goods doesn't look quite as bright at the moment because of winter shipping problem on the Lakes.

3. Steel industry leaders think the Seaway will, for all time, block any migration to coastal areas.

River, Lake St. Clair, St. Clair River, and the St. Marys River below the Sault locks must also be deepened.

The MacArthur Lock at Sault Ste. Marie was built during World War II to Seaway specifications.

Civic authorities in Milwaukee gleefully announced that with Milwaukee a deepsea port, population would climb, industry increase. Chicago, more cautious, indicated the Seaway is an excellent idea, should aid commerce in the area considerably, but would require that Chicago's Sag-Calumet waterway to the south be deepened, local

harbors improved, before the fullest effect of the St. Lawrence project would be felt.

But concrete steps have already been taken. In Ohio, Governor Lausche met last week with mayors from many port and inland cities to study the advisability of establishing a port authority. Cleveland has also set up a committee to study port development. Chairman Lee Howley told THE IRON AGE the committee had already launched an exhaustive economic study to determine what has to be done, what it will cost and what results will be. Mr. Howley said exploratory talks had led committeemen to one heartening conclusion: There is plenty of land available for expansion near the harbor area.

There is, too, some feeling that ports on Lake Ontario and Lake Erie will be the first to profit, along with Detroit—that Chicago will lag slightly behind these areas in that large steamers will be obliged to leave their last port of call at Detroit and go all the way up Lake Huron, through Mackinac and then down through Lake Michigan to Chicago.

Great Lakes shippers are maintaining a strict neutrality. Many feel low cost foreign operations may cripple their operations.



"If those ore carriers get any bigger, they'll be fetching the whole Mesabi Range down here."

*The Iron Age*

## INTERVIEWS.....

### What the Seaway Means to Steel

- ♦ St. Lawrence Seaway will give steel industry a natural means of transporting Labrador iron ore to the U. S., says Ernest T. Weir, head of National Steel Corp.
- ♦ Will strengthen U.S. defenses since ore carriers will be less vulnerable to enemy attacks.
- ♦ Seaway will stimulate our exports to foreign countries. About 80 pct of ocean-going vessels will be able to navigate on the proposed 27 ft channel.

*Q. What is the significance of the St. Lawrence Seaway to the U. S. steel industry?*

A. It provides a natural means of transporting a basic raw material—iron ore—from Labrador to steel mills in this country. It's a logical follow-up to the Labrador development, which was one of initial and major steps taken by the steel industry to assure an adequate future supply of ore for this country. We have an estimated 1 billion tons of ore in Labrador; the Seaway will give us an additional method of placing it where we can use it.

*Q. How will the Seaway affect established steel centers?*

A. To my mind, it will guarantee that plants in inland producing areas will continue where they are now situated. After all, the Seaway will insure an adequate supply of ore by practically the same method of transport as that used to bring in Lake Superior ore. Without it, we would have to haul the ore down the Atlantic Coast to eastern ports and thence by rail inland, or entirely by rail from Montreal, either of which would be much more costly. And the beauty of it is that the cost to this

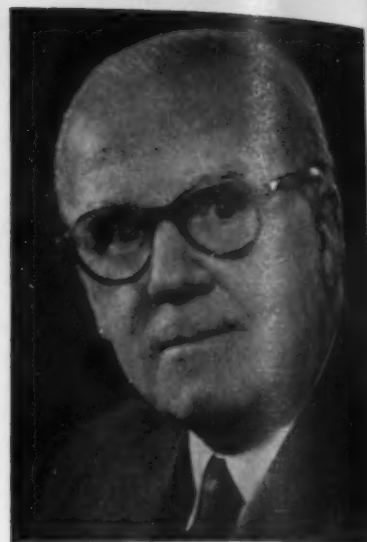
country will be nominal, about \$105 million. Canada will be spending two to three times as much as the U. S. Canada's enthusiasm for it is evidenced by its willingness to go ahead with the project with or without U. S. participation.

*Q. What are its advantages from a defense standpoint?*

A. The Seaway obviously will strengthen the defensive position of the U. S. First it will provide an additional means of bringing in ore by a route that is within our own defense system. Secondly, our relations with Canada are so close and friendly that we can practically count on continuous production in Labrador without interference that might develop with other foreign sources—interference that might come at a most inappropriate time.

*Q. Is the Seaway likely to have any significant effect on the existing steel marketing pattern?*

A. As I see it, the answer is no. From a broader standpoint, I think it will tend to stimulate our trade with foreign countries. The great majority of ocean-going carriers—about 80 pct I believe—could



Ernest T. Weir,  
National Steel Corp.

negotiate the proposed 27-ft channel of the Seaway. These vessels will be able to bring in and take out raw materials and finished goods to and from inland U. S. consuming and manufacturing areas. Foreign trade is a two-way street and the Seaway will be a smoother paving.

*Q. With the Seaway will Pittsburgh, for example, be able to obtain Labrador ore at a delivered price competitive with Mesabi?*

A. Definitely, yes. There are several reasons for this. Transportation cost is likely to be approximately the same as from Lake Superior. But in addition, you must remember, the cost of Lake Superior ore is definitely on the increase due to more difficult mining conditions and depletion of high grade ores, necessitating costly beneficiation. Labrador ore averages about 58 pct iron, while Mesabi ore, including beneficiated pellets, runs about 50 pct, and is gradually declining.

*Q. How will Seaway affect steel's future?*

A. Its importance cannot be overemphasized. Iron ore is fundamental to the future of the steel industry in this country. I have always felt that one of the most sacred obligations of the steel industry to the American people is the long-range development of basic raw material sources.



## USW: Wage Demands Shoot for Moon

**Industry sees union demands as long-range goals, not immediate objectives . . . Few proposals likely to be met . . . Expect 5¢-8¢ boost . . . What union asks—By J. B. Delaney.**

Industry's reaction to steel labor's 1954 contract demands: They sound more like long-range goals than immediate objectives.

After recovering from their initial shock at the magnitude of the proposals, company bargainers finally concluded that the United Steelworkers are merely overworking an old union strategy: Ask for the moon—even a compromise will look good.

### Won't Get It

The union program—embracing wages, pensions, social insurance, and guaranteed wage—is so all-inclusive that a cost estimate was virtually impossible. One industry observer guessed the package would double wage costs.

Final settlement is not likely to resemble even slightly the "package" advanced by the USW. Industry spokesmen have repeatedly stressed the depreciated earnings and operating position of the industry and competitive market conditions that dictate reducing rather than increasing costs. The betting still favors a 5¢ to 8¢ package settlement, including wages.

If the union is serious about some of its demands, a strike could develop despite apparent eagerness of both sides to wind up the negotiations peaceably and quickly.

### Who Runs Company?

Details of the program were "leaked" to the press last Friday after the union and U. S. Steel Corp. concluded preliminary discussions and additional companies opened tentative negotiations with satellite bargaining teams of the union. Serious bargaining between the union and U. S. Steel will begin early next month. Contract expiration date is June 30.

Many of the USW demands would amount to further encroach-

ment on management prerogatives in scheduling work, setting up incentives, establishing production standards, regulating size of crews, etc. The battle over management rights is an old one in steel labor history and an issue that could generate extreme bitterness.

As an opening thought, the union reminded the steel companies of the "serious unemployment" situation in the industry and added that if things don't improve soon the union will propose a "6-hour day with 8 hours pay" to spread employment. This, alone, would represent a 25 pct increase in wage costs.

### What They Want

Then the USW listed its demands:

Minimum pension of \$100 per month for 25-year men exclusive of social security, and including those workers already retired. Present plan is \$100, including social security. Workers would

have vested rights in pension benefits; all plans would be funded to provide for current, past services; eligibility would be reduced from 15 to 10 years; pension would be guaranteed for life; plan would be supervised jointly.

Unspecified increase in wages; elimination of all geographical wage differentials; mutual agreement on incentive changes; union may file grievance on new or changed job classifications; two additional paid holidays, with triple time for holidays worked and quadruple time for overtime work on holidays; increase reporting allowance from 4 to 8 hours; increase shift differentials from 6 and 9 to 10 and 15; time and one half for Saturday work, double time for Sunday; penalties for variation from 5 days on, 2 days off work schedules; 1 week vacation for 1 year of service, 2 weeks for 2 years, 3 weeks for 5 years and 4 weeks for 15 years.

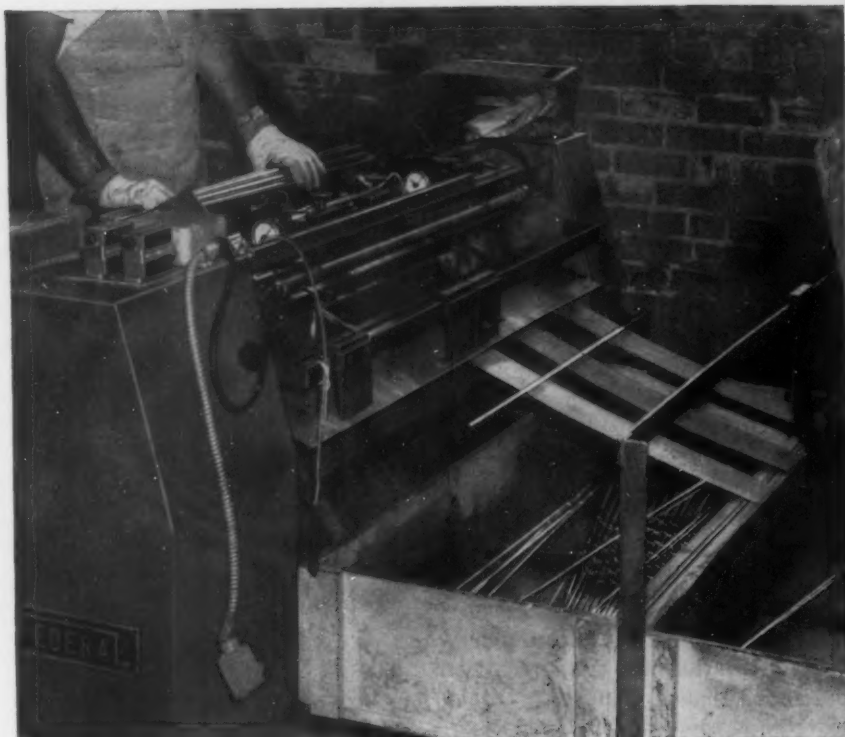
Full union shop.

### Cradle to Grave

Seniority will be governing factor if man can do work; layoffs will be on plant-wide basis, based on plant rather than departmental seniority; distribution of work will be mandatory; workers laid



FRIENDLY CHAT between Ben Fairless and Dave McDonald took place at opening session of U. S. Steel-United Steelworkers contract negotiations.



**Golfers and Golf Club Makers Win** because this Federal Eccentricator Gage detects built-in hooks and slices in golf club shafts. Its 3 electrical Eccentricators inspect for straightness and automatically sort into good and bad. Gage is adjustable for lengths. Also measures and sorts tubular auto antennae and parallel tubes.

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**Until recently** many manufacturers of products such as the one above thought that only machine parts producers could afford high-speed measuring, inspecting, sorting and size-control gages. But they discovered that costly engineering was not always required to apply gages for special purposes. So they replaced their outmoded methods with modern methods. Now they're winners, too.

**"Special" gages are now standard** in the complete line of modern Federal gages. That's because Federal has engineered more than 30,000 dial

indicating, air, electric and electronic gages . . . each for a specific reason.

**That tremendous backlog of gaging experience** is important to you. Chances are that Federal already has the *one* gage that will cut costs on one of your measuring, inspecting, sorting or size-control operations. Or, maybe a slight adaptation will do the job. In either case, you'll save time and money.

**It costs nothing** to find out whether Federal can furnish a gage that will boost your quality while cutting your costs. So, why not write for a Federal Sales Engineer to talk over your dimensional maintenance problems. Federal Products Corporation, 4135 Eddy St., Providence 1, R. I.

Ask **FEDERAL**

**FOR ANYTHING IN MODERN GAGES...**

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Machine Size Control.

## Labor

off at one plant will have preferential status based on seniority for job at another; no new employees will be hired if unit works less than 40 hours a week.

Contracting out by local agreement only; retroactive awards on grievance settlements; suspension and discharge may be moderated by an arbitrator; severance pay for workers "laid off" as well as "terminated"; vacation pay for servicemen; company will pay for all protective devices needed by workers, will pay for layoffs due to unsafe conditions; company will pay difference between workmen's compensation and average earnings.

### GAW Plan

Company will foot the entire cost of social insurance program, which would include \$5000 life insurance; sickness and accident benefits of \$50 a week for 52 weeks; hospitalization benefits would cover everything that conceivably could happen to a worker and his family.

Guaranteed annual wage. This would be paid for by a 4 pct tax of the company payroll, payable into a trust fund to be administered by the company but subject to grievance and arbitration procedures on disputed cases. Company liability would be limited to money in this fund. Benefits would be 32 times the worker's standard hourly rate for a period of 52 weeks, would be paid for both total and partial unemployment.

### Unions Must Maintain Good Faith

Labor unions and employers have the same responsibility to bargain in good faith, National Labor Relations Board emphasizes.

A union which stages deliberate slowdowns and directs other actions against management while negotiations are in progress is refusing to bargain and therefore violating the Taft-Hartley Act, NLRB says.

The Board presented this ruling after weighing unfair labor practice charges brought by Personal Products Corp., Chicago, against the CIO Textile Workers Union.



**INDUSTRIAL HEATING EQUIPMENT** day is planned for this year's Metal Show by public relations committee of Industrial Furnace Mfrs. Assn. which met last week at Hot Springs, Va. Left to right: C. H. Vaughan, Electric Furnace Co.; C. F. Olmstead, Lee Wilson Engineering Co.; Henry M. Heyn, Surface Combustion Corp.; C. H. Stevenson, Lindberg Engineering Co.; William Adam, Jr., Ajax Electric Co.; W. E. Benninghoff, Tocco; and A. E. Tarr, Leeds & Northrup Co.

### Furnaces:

#### IFMA adds electric heating equipment division.

A new division was added to the Industrial Furnace Manufacturers Assn. last week at the association's spring meeting in Hot Springs, Va. The new group now includes most of the manufacturers of induction and dielectric heating equipment in the United States.

The association's public relations committee announced plans developed with the American Society for Metals to hold an "IFMA Day" at the Chicago Metal Show this November. Actually, there'll be a day and a half program on industrial heating, including half a day for induction and dielectric heating.

#### Stress Sales Promotion

Chances are the name may not be "IFMA" by that time. Addition of electrical heating to the association's present furnace and combustion divisions has intensified a movement to change its name to more properly indicate the broad scope of the association's interests.

Theme of the meeting was "Sales Promotion," recognizing today's need for harder selling. H. S. Schuler, assistant general advertising manager, Westinghouse Electric Corp., told the group what management should expect from advertising. He was followed by M. F. Ranney, vice-president, Fuller & Smith & Ross, who headed a recorded panel criticism of members' advertisements.

Though panel comments were brutally frank, most of those whose ads were excoriated felt that the session was very valuable.

### Outlook:

#### Purchasing agents report slow, steady uptrend.

The gradual uptrend in general business activity that began in April was still in effect this month reported a majority of National Assn. of Purchasing Agents' business survey committee.

For the third consecutive month, the committee reported that increases in orders and production topped decreases by a comfortable margin. May shows the lowest number reporting decreases since last June. Industrial material prices are firm but have failed to strengthen as in April. Price softening appears to be in the fabricated items more than in basic materials.

Purchased material inventories, though still on the down trend, in-

dicate that correction has been completed by the majority, as 64 pct reported holding to present or moderately increasing stocks. Employment trend is slightly up. Buying policy is conservative, short range, and is expected to continue that way as long as availability of materials remains easy.

Statistics indicate that purchasing executives, barring strikes or international disturbances, are optimistic for steady, gradual improvement in industrial business.

#### Report Some Declines

Industrial materials prices have failed to demonstrate strength as in March and April. Some declines are reported in the fabricated products where marginal concessions are being made. Basic materials prices are considered firm.

Unworked purchased material inventories continue the down trend at a slower pace than during the past months. General opinion holds that inventories can be kept low because of short lead times and large warehouse stocks. There are a few reports of buying extra steel as a strike hedge.

### Norton Revises Abrasive Pricing

Easier buying and selling is the aim of the new Norton Co. net pricing system for grinding wheels. It is no longer necessary to calculate the price of a wheel, segment, brick, stick or mounted point by the old method of applying multipliers to list prices.

Net prices can now be quoted quickly for over 25,000 stock items.

### Companies Cut Stock, Bond Offers

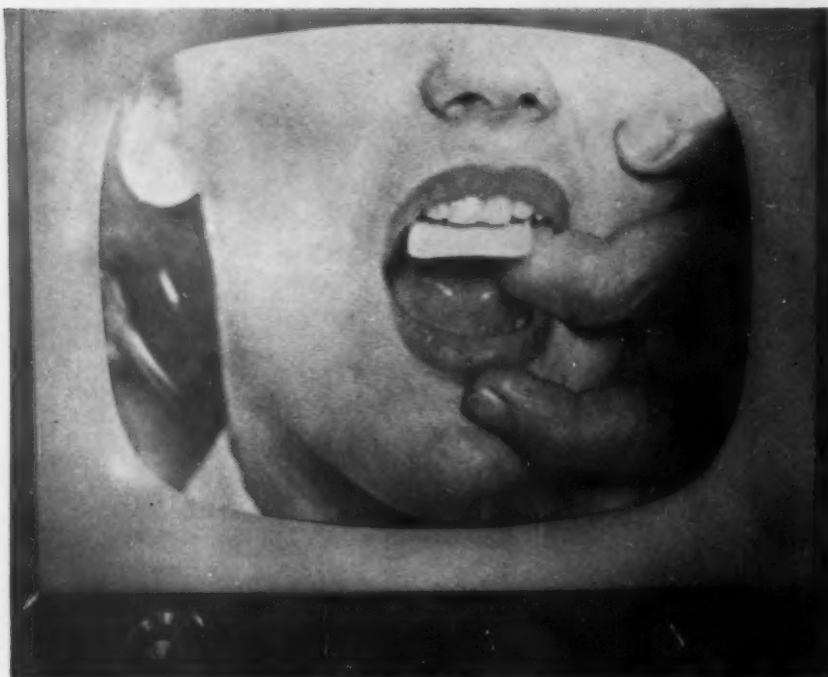
U. S. corporations curtailed their outside fund-raising in the first 3 months of this year 10 pct below the corresponding period of 1953, Securities Exchange Commission reports.

Total new stocks and bonds up for sale in the first quarter of 1954 amounted to \$1.8 billion. The decline, the agency said, was caused primarily because manufacturing companies dipped into cash assets to finance operations.

#### Attention Steel Buyers

For up-to-the-minute nationwide information on steel markets, see the new Iron Age department on p. 163. Written in Pittsburgh, it condenses in concise, quick-reading form reports on each major mill product gathered by Iron Age editors in major industrial centers. Local markets are compared with the overall national scene.





TELECAST of dental demonstration for benefit of students indicates training value of television.

## TELEVISION: Industry Uses Gaining

**Volume hit \$3 million in '53 . . . See jump to \$10 million within 2 years . . . Producers aim at further price cuts . . . Color needed for some applications—By R. M. Lorz.**

Industrial television still can't compete with commercial shows in any popularity polls but closed circuit systems are playing to a growing audience. At the moment the all-seeing camera eye is being successfully used to check everything from underwater construction to jet engine flames. Sponsors of a recent electronics convention went video by spotting six industrial cameras to flash important announcements to delegates gathered in lobbies and dining rooms.

### Thompson Jumps In

A quick glance at available market data indicates the trend is here to stay. Nationwide sales of industrial TV cameras, monitors and related equipment netted a handful of producers something like \$3 million in the past year. And authorities estimate the take will jump to around \$10 million within the next 2 years. By 1960, experts unanimously agree, color refinements and design simplification will push sales figures much higher.

TV is still relatively new in most industrial areas and hasn't reached the bonanza stage as far as prices and application techniques are concerned. However, the field is expanding rapidly and many executives feel that now is the time to do a little prospecting in electronic recording. Payoff on utilization of this new plant technique seems bounded only by the limits of imagination.

From the suppliers' standpoint Thompson Products, Inc., Cleveland, affords a good example of how a firm studies a trend, decides to diversify and then moves in on the ground floor. Engineers and scientists connected with the firm's electronics division probed the potential of industrial TV for over 2 years before Thompson purchased the stock of Dage Electronics Corp. a few months ago. Dage, a pioneer in development of industrial TV equipment, is located near Indianapolis.

This marriage of convenience resulted in a happy combination of

talents. Former Dage President Jim Lahey, who will continue to head up the Indianapolis development, was one of the pioneers connected with Chicago's station WBKB in 1941. Thompson Products has grown to be one of the largest suppliers of automotive and aircraft parts in the country mainly through the medium of new product design. Youthful Bill Jones, head of Thompson's Electronics Div., is working closely with Mr. Lahey in mapping an all-out production and marketing campaign.

### Stress Applications

He told THE IRON AGE that Thompson Products intends to stress lightweight, ease of operation, standardization of parts and, above all, application. Typical American interest in "gadgets" will of course provide an opening wedge but the novelty angle is being played down.

Officials connected with the new product realize that selling a technique is something out of the ordinary. To cope with the problem, Dage has already launched an extensive program in applications research. As demand increases and production is stepped up, a team of specialists will be ready to contact industries with which they are familiar. TV specialists who have already garnered a good deal of experience in sales work are also counting on help from line foremen who are in the best position to spot application possibilities.

### Aim at 600 Units

A brief survey of present market conditions indicates that all of this planning will not be in vain. It's true that at present there are about 500 closed circuit installations operating in plants throughout the country. But rapid growth seems to be a sure bet because prohibitive prices have been slashed.

Last year Dage produced an es-

estimated 100 industrial units in addition to professional equipment for commercial stations. This year Thompson is aiming at minimum production of at least 600 closed circuit systems.

What will these systems cost the prospective buyer? Plants interested in installing a black and white camera, 14-in. monitor and motor-driven remote control unit can get by with an initial investment of slightly less than \$1500. If remote control of panning, tilting and focusing isn't required the bill is \$400 less.

#### Seek Further Price Cuts

Color units, a must in many phases of industrial testing and research, have also tumbled down the price ladder. Not too long ago the complicated set up required for color reproduction called for an investment of from \$35,000 to \$60,000. In Chicago this week Dage unveiled an industrial color unit which will sell for \$11,000.

While sizeable price reductions have been effected, the battle to make TV units even more attractive goes on. Every company in the field is pulling out all stops to put first things first. That means the price of pick-up tubes has to be cut. RCA's Vidicon which is now being used in many black and white models retails for \$345 and boasts a life expectancy of 1500 hours. Other more expensive tubes usually advertise longer life. Finding a happy medium will depend on the speed with which producers can refine production techniques and design.

#### Has Steel Mill Uses

In addition to developments in color and black and white reproduction experiments on infrared pick-up tubes are also being pushed. Obvious advantages in plant protection should make this camera a real bargain. In effect, use of the infrared unit will enable any plant to station an electronic night watchman with better than 20-20 vision in its parking lot or at other strategic locations.

Industrial TV has already been used for broadcasting production

control data and controlling in-plant traffic. It could be used to study supersonic rocket performance and test flights. It could also be used to good advantage in the steel industry for studying open-hearth and blast furnace practice and many other production techniques. Commercial possibilities also seem boundless.

Looking over this new horizon, people at Thompson Products are optimistic in a practical way. They feel the company will have to start searching for new plant sites within the next 6 months to meet the expected demand.

## Radio:

### Non-entertainment broadcast stations grow at rapid rate.

Industrial companies and professional and safety organizations are increasing their use of two-way radio at a rapid rate, Federal Communications Commission discloses.

Even so, the agency has no fear that the number of frequencies will be exhausted, despite the swift growth in the total of non-entertainment stations. This reassuring word comes from Edwin L. White, head of FCC Safety & Special Services Radio Bureau.

Thus far, FCC has authorized

250,000 radio stations, in contrast to the 21,000 existing in mid-1946. The current number does not include commercial broadcasting outlets.

White's bureau handles about 14,000 applications for stations and operators' licenses each month, compared with 32,000 for the entire 1946 fiscal year. About half the separate radio services now offered did not exist before World War II.

Just less than half the stations now operating are owned by "ham" operators. Others are included in factory, oil company, and logging camp systems; transportation services; and police and fire department communications nets.

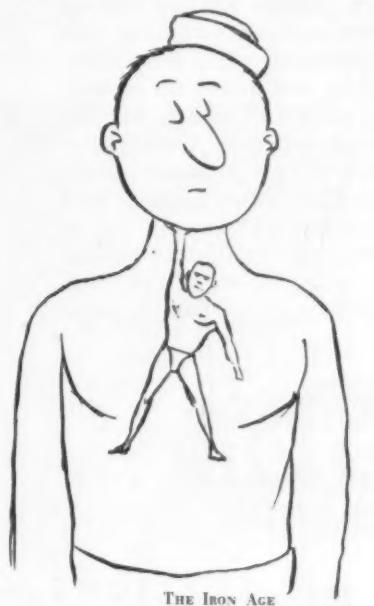
Despite the FCC view that the radio spectrum still has considerable capacity, the agency has not granted a long-pending request for a separate radio service to be used by manufacturers. The Committee on Manufacturers Radio Use opened its campaign last year to get such a service.

## TV:

### British Navy finds waterproof camera a salvage aid.

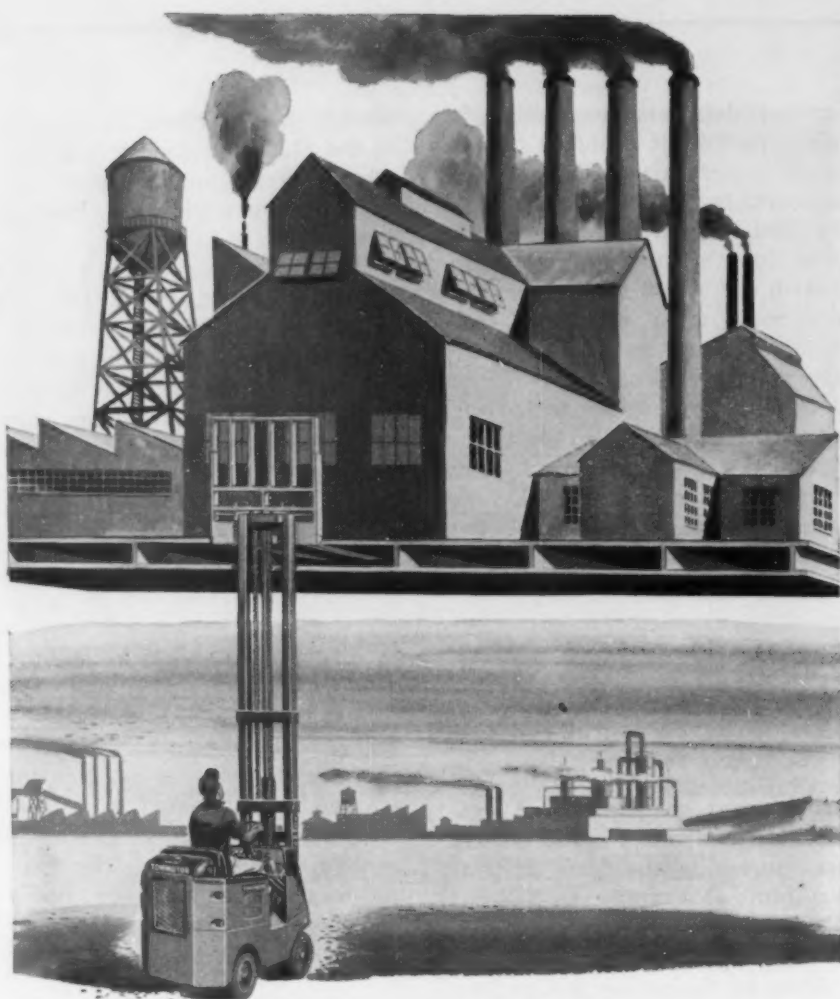
Application of underwater television in ship salvage and repair was discussed by Lieut.-Commander Jack Bathurst, Royal Navy, at a joint meeting of Institution of Naval Architects and Institute of Marine Engineers. He said that a portable underwater TV camera with a buoyancy weight of 1 lb under water was first used to inspect the sunken submarine *Affray* in the English Channel three years ago.

Under 24 in. long and 10 in. in diameter, the camera is designed to take underwater pressures at a depth of about 300 ft. Underwater TV can effect great savings of time and money in drydocking ships. If a ship with underwater damage needs drydock repairs, a TV survey can determine extent of repairs needed so that new sections can be prefabricated before the vessel enters dock.



THE IRON AGE

BOB KAIN



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## Controls

### Titanium:

**New BDSA order assures civilian users some titanium.**

New military orders for titanium mill products will be restricted to 90 pct of a producer's output in any calendar month.

This restriction, provided in the new Business and Defense Services Administration Order M-107, means at least 10 pct of products made will be freed for civilian use. Order is effective with June shipments.

Any producer who has already accepted rated orders calling for deliveries over the 90 pct limit must proceed with them, regardless of M-107.

Beginning in June, companies turning out titanium mill products will be required to send detailed schedules of their projected output for rated orders to the Aircraft Production Resources Agency, Dayton, Ohio.

M-107 directs APRA to forward each schedule and the agency's recommendations to the Defense Dept. which will add its own recommendations and send the schedules to BDSA. The latter agency will review the schedules and the Defense Dept. views before issuing directives to producers covering their production for rated orders in the 2 succeeding months.

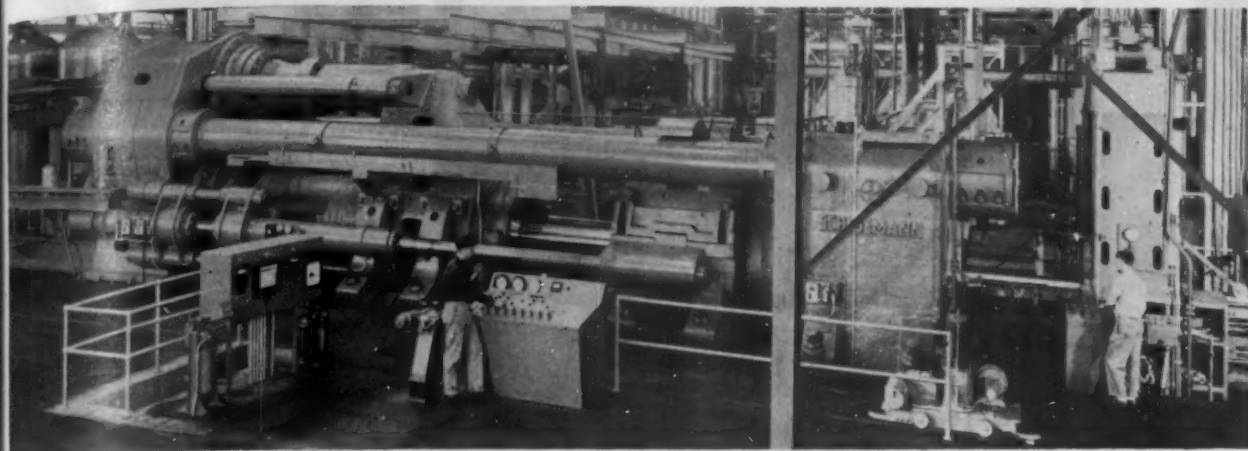
BDSA expects this procedure to provide a close check on the amount of titanium products required by the military and, at the same time, to assist in development of a civilian market for these materials.

### Cut Copper, Brass Mill Setasides

Business and Defense Services Administration last week issued Amdt. 4 to Order M-11A, cutting back the amount of mill space reserved for rated orders in third quarters by producers of copper and copper base alloys.

Production directives from BDSA will continue to cover reserves of mill space for output of military ammunition cups and disks and for copper base alloy powder mill products.





GERMAN-BUILT monster press is now extruding hard aluminum alloy wing spar parts for Air Force giants.

## HEAVY PRESS: Start Regular Output

**Alcoa shifts from trial to production runs on 14,000-ton extrusion press . . . Extrudes plane parts up to 110 ft. long, 2500 lb . . . Permits lighter parts, quicker, cheaper production.**

The shakedown cruise is over. Aluminum Co. of America has begun actual production with the 14,000-ton extrusion press installed at Lafayette, Ind., as part of the Air Force heavy press program. It's squeezing out king-size aircraft parts of hard aluminum alloys.

Press is the second of two 13,200-tonners built by Schloemann Engineering Co., Dusseldorf, Germany. Both were built during World War II, though neither got into production in time to help the Nazis. The first one completed was

installed at Varen, Mecklenburg. It disappeared behind the Iron Curtain within weeks after the Russians occupied the area in 1945.

Second press hadn't yet been completed. But arrangements were made under the Air Force program and Schloemann went back to work on it. Alcoa was to lease it from the Air Force and Alcoa engineers went to work partially redesigning the monster in conjunction with the manufacturer. In this redesign capacity was upped to 14,000 tons.

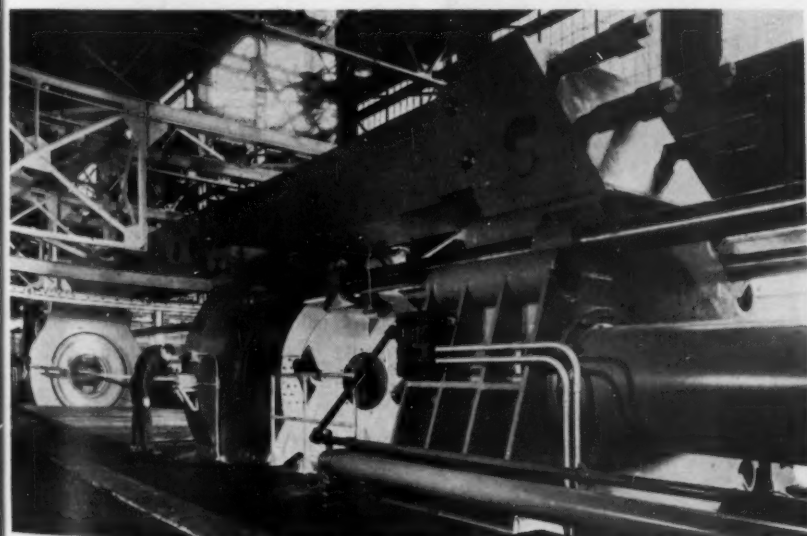
But the press itself is only a part

of the picture at Lafayette. Associated and auxiliary equipment is just as impressive.

Stretcher for straightening extrusions with tension is 180 ft long, can handle 110-ft extrusion—and can give a tug of 3,000,000 lb. That's enough pull to straighten 75S extrusions up to 60 sq in. in cross section.

Extrusion ingots up to 29 in. diameter and 6 ft long are heated in a battery of 60-cycle induction heaters. Extrusions are solution treated in a 120-ft long horizontal furnace or smaller vertical furnaces that can take lengths up to 40 ft. And after stretching, final precipitation heat treatment is done in a 120-ft gas-fired aging oven. Roll contouring machines and untwisting machines are also available.

First metal the press pushed



EXTRUSIONS are straightened in king-size 3,000,000-lb stretcher.



INGOT is held in cylinder, ram pushes metal through die at end.

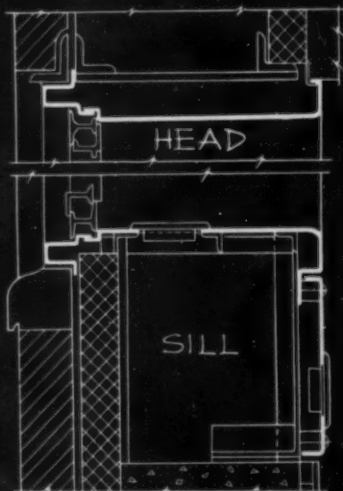
do you  
want  
simplicity  
yet flexibility  
of  
design?



Mt. Pleasant Sanitorium, Baltimore  
John K. Ruff, Inc., Contractor, Baltimore  
The Office of James R. Edmunds, Jr.,  
Architect, Baltimore

**EXTERIOR**  
view above illustrates  
the series of door and  
subframe combinations  
contract manufactured  
by Brandt.

**INTERIOR**  
detail shows  
bullnosed metal heads,  
jambes and stools with  
heating grilles and  
convector fronts furnished  
as an integral unit with  
exterior subframe,  
bricked in.



call



for contract manufacture of

**STAMPINGS**

**FORMINGS**

**WELDMENTS**

CHARLES T. BRANDT, INC., BALTIMORE 30, MARYLAND

## — Production —

through a die was last August. Since then Alcoa engineers have been ironing out the bugs usually found in any new piece of equipment and finding out what it could do. They haven't got all the performance answers yet but the ones they have evolved are extremely impressive.

Press can extrude pieces up to 110 ft long, weighing up to 2500 lb—that's a weight per ft of 22.7 lb as compared to the 5.4 lb per ft maximum Alcoa could offer in that length before.

### Have Civilian Uses

Maximum cross-sectional area of extrusions of this length is 19 sq in. High unit pressures—153,000 psi on a 15.25-in. diameter ingot—also permit thinner-walled extrusions to be made.

Right now this means that aircraft parts can be made lighter, quicker and cheaper. Wing spar caps, for instance, can now be made larger and longer, eliminating much of the joining now required in production of such aircraft types as the B-29, B-50, B-52 and C-124. For smaller aircraft, use of stepped extrusions will permit whole one-piece spars to be produced with a minimum of machine tapering.

For the future there's no reason why these presses can't turn to civilian products. Pipe up to 20 in. diameter can be extruded in the big press. And some day king-size extrusions will be available for ship, railroad, car, bus, truck and trailer construction.

### U. K. Steelmaking Costs to Rise

British steel industry estimates its steelmaking costs will be upped \$12.6 million per year as a result of the recent increase in coal prices (THE IRON AGE, May 6, 1954, p. 87). And this figure represents only the minimum direct impact of the coal hike—indirect effects are expected to raise steelmaking costs even more.

Hardest hit are iron foundries which are already having difficulty getting orders. One source estimates cost increase for iron foundries in Scotland will be around \$2.57 per ton.

# STEEL: Kaiser Gets Oxygen Rights

**Exclusive U. S. rights to oxygen bessemer process now held by Kaiser Engineers . . . Claim \$3 per ton cost saving . . . Many steelmakers indicate keen interest—By T. M. Rohan.**

Kaiser Engineers, of Oakland, Calif., last week bottled up exclusive U. S. rights to design, construct and license the Brassert oxygen steelmaking process developed in Austria and Switzerland.

Agreement followed lengthy negotiations with the Brassert firm and two other operating members in Europe as well as 18 months of experimentation, principally on fume control. Cost savings of about \$3 per ton are claimed for the method, which puts production cost at an estimated \$14.50 per ton of steel.

Dr. W. C. Rueckel, of Kaiser Engineers, told THE IRON AGE, "There are almost 5 million tons of bessemer capacity in the U. S. at the present time. With the drop-off in operations, a considerable amount of this is available for experimentation with the Brassert process. About 70 to 80 pct of this equipment can be used for oxygen steelmaking and we expect interest to be lively."

## To Operate in Summer

He also indicated that preliminary discussions have already been held with firms such as Jones & Laughlin Steel Corp., Weirton Steel Co. and Youngstown Sheet & Tube Co. These talks were not pushed until the agreement with Brassert was formalized. Dr. Rueckel added that many American steel producers have already visited the three European plants now in production.

He said reports on additional developments in Europe and Canada will be funneled through Kaiser engineers for use by industry in this country. Dominion Foundry & Steel Co., Hamilton, Ont., holds the Canadian rights to the Brassert process and is expected to be operating with it about July or August of this year.

Kaiser's adaptation of the process for U. S. use has been concentrated mainly on linings and fume control, according to Dr. Rueckel. He said that attempts to measure interior temperatures optically indicate it is about 3000° to 3200°F, making much thicker linings mandatory.

In Europe the huge volume of dust generated is simply exhausted into the atmosphere. To reduce cost of necessary dust collection systems here, sealed converters with water cooling will be used. Water cooling will also be used on the vessels with no slowdown of the charging time.

## Water Cool Converters

Additional major innovation in U. S. practice is expected to be charging and pouring from the same side.

Gas control and recovery system is entirely closed and is designed to meet air pollution codes

throughout the country. Since size of the gas handling system is dependent on volume to be handled, it must be kept as compact as possible.

After flowing through a series of cooling towers, multiclones and filtration equipment, extracted particles can be briquetted or otherwise disposed of while the cleaned gas moves on to storage in a gas holder.

## Produces 52 Tons Per Hour

This stored gas would contain 80 to 90 pct carbon monoxide with a heating value of 250 to 290 Btu per standard cu ft. Gas would contain no more than 0.015 grains of particulate per cu ft.

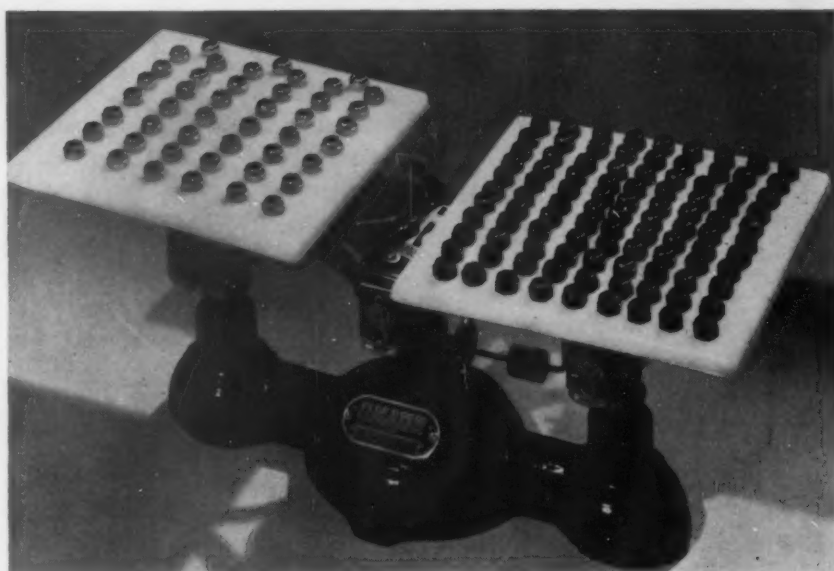
Output of a single oxygen vessel is approximately 52 tons per hour, about three times that of a single modern openhearth, according to Dr. Rueckel.

Kaiser estimates construction cost for a new two-converter shop involves investment of about \$6.3 million. Of this, about \$3.4 million would be in buildings and equipment, \$1.9 million in the oxygen plant, and \$990,000 in fume control. A comparable new 500,000-ton openhearth plant is estimated at \$17.5 million.



**JOINT AUTHORS (l-r) Joseph J. Oravec, Dennis J. Carney and Elgin Van Meter hold AIME scrolls for paper on openhearth practice. All are with U.S. Steel's South Chicago Works metallurgical division.**





WEIGHT SAVING of new aluminum alloy locknuts is shown by fact that 99 aluminum fasteners equal the weight of 45 conventional steel locknuts. Use will be mainly in aircraft.

## New Locknuts Cut Aircraft Weight

Airline designers and cost accountants have figured that 1 lb eliminated from the weight of a transport plane results in an additional \$20 in annual revenue for the plane. No detail is too small to escape the weight cutting designer's search for pounds that can be pared away without sacrifice of strength and safety.

Four new lightweight locknuts introduced by Elastic Stop Nut Corp. of America, Union, N. J., offer designers an opportunity for weight savings throughout the whole range of aircraft locknut applications.

Redesign of locknuts to make use of lightweight aluminum alloys instead of conventional steel is what made the weight shaving possible.

ESNA's new lines cover most aircraft locknut requirements—small and large sizes; hex, anchor, and gang channel nuts; for all ranges of temperatures from  $-70^{\circ}$  to  $1200^{\circ}\text{F}$ . The new nuts can be used in assembling basic aircraft structure; attaching components such as carburetors or pumps, and parts such as access panels; and in assembling and attaching accessories such as armament, electronic gear, and bombsights.

### Could Cut Weight 115 Lb

Weight reductions are of the order of 0.5 to 2.5 lb per 100 nuts. Significance of such weight savings is apparent when it is realized that a typical modern fighter plane may have as many as 75,000 locknuts in its airframe alone, and a big bomber may contain a quarter of a million.

Weight-saving potentials of ESNA's four new lines of stopnuts are as follows:

Types Blue J nuts average 65 pct lighter than ESNA's equivalent steel locknuts, Type Y nuts 25 pct lighter, Type LH nuts 45 pct lighter, and Type ZA1W nuts 30 pct lighter. All can be used with steel bolts and all of them have been approved for use on Air Force, Army and Navy aircraft.

As an example of potential weight savings, a major aircraft manufacturer estimates that if Blue J type nuts were to be used on all the structures assembled in that plant, it would result in a direct saving of 115 pounds in a medium bomber. This figure does not include replacement of thousands of nuts used on components and equipment assembled elsewhere for use in this aircraft.

## Stockpile:

**ODM has filled half of its stockpiling goals.**

Federal procurement specialists, with half the national stockpile goals accounted for, have set their sights on the remaining 30-odd classes of materials included in the total objective.

Dollar-wise, the \$4.2 billion worth of strategic, short-supply items in the stockpile inventory last Dec. 31 constituted 60 pct of the objective. Counting those materials on order at that time, \$5.1 billion worth could be checked off as of that date.

This latter amount equals 75 pct of the ever-varying dollar objective of \$6.8 billion. Objective had declined from the \$7.1 billion figure of last June 30.

Of the 76 materials stockpiled under the program administered by Office of Defense Mobilization, 39 were in inventory or ordered in full when 1953 ended. This meant only 37, or fewer than half the individual goals, remained to be filled.

### Study "New Look"

This number may have decreased even more since that time, but the latest ODM report to Congress on the stockpile status covers only July-December, 1953. Considerable progress was being made in procuring 13 materials, with 80 pct of their total quantity covered by outstanding contracts.

Certain materials, however, including asbestos, columbite-tantalite, mica, and selenium are still difficult to find in quantity. The government is trying to work out with selenium producers some method of increasing production.

Of the \$350 million in critical materials delivered to the stockpile in the second half of 1953, surplus government-owned materials made up a little more than \$3 million worth.

Because of the cut-off date on the ODM report, there was no discussion of larger goals which will be needed as part of the new stockpile policy decided on earlier.

# REPORT TO MANAGEMENT..

## Throw out the rule book

In sizing up the business outlook forget about conventional economic indicators, keep your eyes on Washington. Big factor is how strong a stand we're going to take in Southeast Asia. Administration is thrashing this out at the moment; expect a policy decision soon.

Odds seem to be against our entering a shooting war--right now. This could change suddenly, but prospect is we'll settle for increased military aid to Southeast Asia, buildup of our own defense strength.

Whatever happens on Southeast Asia, effect on our economy won't be the same as when we went into Korea. Too much of our productive capacity is untapped at present, and the military is in much better shape than in 1950.

This means a get tough policy shouldn't be so much of a shock to the economy, though it can't miss having a slightly inflationary effect.

## Few shortages if...

There shouldn't be any real material shortages except for nickel --possibly aluminum if we step up Air Force strength considerably. Copper might also feel a squeeze. Steel, now operating at 70 pct of capacity, should be okay.

But manufacturers and consumers could strip the gears if they get scared.

Most manufacturers have been paring inventories, but remembering Korea they might all start ordering way above needs if it looks as if we're plunging deep in Southeast Asia.

Consumers might get fidgety about possible price increases and start queuing up for goods, particularly durables.

## It boils down to this...

Outlook boils down to this: A strong stand in Southeast Asia doesn't necessarily mean a violent change in the economy. It could be taken in stride. But scare buying by consumers, manufacturers might start us on an inflation spiral.

## How important is the Seaway?

When they ask you 15 years from now what was the most important development in the U. S. during the 1950's, work on atomic energy or fashioning the H-bomb may rate top spot. But not far behind will be passage of legislation giving the green light on construction of the St. Lawrence Seaway.

It's going to hurt a lot of people: East Coast and Gulf ports; truck and rail traffic in certain areas. But overall it will be a boon to most everyone in the U. S.

If you're not situated so that increased traffic on the St. Lawrence and Great Lakes will mean more business or cheaper shipping for your firm, you will at least benefit indirectly from the reduced costs of producers and suppliers who do get direct aid.

May 27, 1954

# Industrial Briefs

**Established . . .** THE WATSON-STILLMAN CO. division of H. K. Porter Company, Inc. has established sales, service and manufacturing facilities in Holland through a wholly owned subsidiary, Watson-Stillman Internationale Maatschappij, N. V., Rotterdam.

**Dividend . . .** REPUBLIC STEEL CORP., Cleveland, has declared a quarterly dividend of \$1.50 per share on the 6 pct cumulative convertible prior preference stock, Series A, payable July 1.

**Congrats . . .** THE NATIONAL RADIATOR CO., Johnstown, Pa., celebrated its 60th birthday earlier this month.

**Elbow Room . . .** TRUCK-TRAILER MANUFACTURERS ASSN. INC., has moved to larger quarters from National Press Bldg. to Albee Bldg., 1426 G Street, N. W., Washington 5, D. C.

**Official Representative . . .** John L. Neudoerfer, president, WHEELING STEEL CORP. left for Paris recently where he will attend the Second International Conference of Manufacturers. He is attending this meeting as an official representative of the National Assn. of Manufacturers, of which he is national director.

**Opened . . .** HEPPENSTALL CO., Pittsburgh, has opened a new warehouse and office at 6440 Fleet St., Los Angeles.

**Hear Ye . . .** PURCHASING AGENTS ASSN. OF ROCHESTER, INC. has elected Gerald J. Andres, Fasco Industries, Inc., as president.

**Tourists . . .** ADAMAS CARBIDE CORP., Kenilworth, N. J., played host to the New York and New Jersey Chapter of the Society of Carbide Engineers at its new million-dollar plant recently.

The new plant is located at the corner of Market and Passaic Streets in Kenilworth.

**Started Up . . .** INLAND STEEL COMPANY blew in an additional blast furnace at its Indiana Harbor, Ind., plant last week.

**Leasing Plan . . .** THE GISHOLT MACHINE CO., Madison, Wisc., has a plan for the leasing of machine tools. Three plans are available, each based on a 7-year lease agreement.



**HERBERT HARIG**, vice-president of Harig Manufacturing Corporation, Chicago, has been elected secretary of National Tool & Die Manufacturers Assn. He succeeds the late Albert Goldman of Philadelphia.

**Re-Elected . . .** SCIENTIFIC APPARATUS MAKERS ASSN. re-elected Edward J. Albert president at its annual meeting recently at the Broadmoor, Colorado Springs, Colo.

**"Gone Fishing" . . .** GARRISON MACHINE WORKS, INC., Dayton, will be on vacation from July 11 through July 26.

**Distributor . . .** KAISER ALUMINUM & CHEMICAL SALES, INC. has named T. E. Conklin Brass & Copper Co., New York, a distributor of Kaiser Aluminum mill products in metropolitan New York and vicinity.

**Well Done . . .** CATERPILLAR TRACTOR CO. received the National Safety Council's 1953 Public Interest Award for its "initiative and skill" in using mass communication media in the fight against automobile accidents.

**New Home . . .** AMERICAN MACHINE & FOUNDRY CO., New York, has moved its executive, administrative and sales office to 261 Madison Ave.

**Successful Venture . . .** AUTOMATIC TRANSPORTATION CO. reports wide acceptance of a new industrial truck leasing plan after only 6 months' operation.

**Branch Office . . .** THE COOPER-BESSEMER CORP. has opened a branch office at 5716 France Ave., S., Minneapolis, with R. B. Scott in charge.

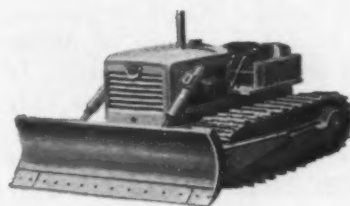
**Warehouse Opened . . .** FORD TOOL & CARBIDE CO. is a new warehouse in Birmingham, Ala., that has just been opened by Thomas C. Ford and Robert C. Ford. It is a metal cutting specialty house.

**Elected . . .** STEEL JOIST INSTITUTE, Washington, elected Walter H. Stewart, vice-president of the Virginia Steel Co., as president, at its annual meeting.

**New Moniker . . .** DELAWARE VALLEY MACHINERY, INC., Phila., is the new name of Sales & Service Machinery Co., Inc.

**New Division . . .** EATON MFG. CO. has created a new division to be known as the Aircraft Div.; it is located in Battle Creek, Mich.





Make it **WEIGH LESS** and **LAST LONGER** with



You can design light weight, longer life, and economy into your products by including N-A-X HIGH-TENSILE in your plans.

It is 50% stronger than mild steel.

It is considerably more resistant to corrosion.

It has greater paint adhesion with less undercoat corrosion.

It has high fatigue life with great toughness.

It has greater resistance to abrasion or wear.

It is readily and easily welded by any process.

It polishes to a high lustre at minimum cost.

And with all these physical advantages over mild carbon steel—it can be cold formed as readily into the most difficult shaped stamping.

Sound like something for you? Ask for full facts and think of N-A-X HIGH-TENSILE when you re-design.

## GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division

Ecorse, Detroit 29, Michigan

NATIONAL STEEL



CORPORATION

May 27, 1954

# The Automotive Assembly Line

## Packard, Studebaker May Merge Soon

**Nance's revamped Packard organization at crossroads . . . Must combine now or go it alone . . . Union with Studebaker would cover market . . . South Bend mum—By R. D. Raddant.**

Time may be the important factor if the rhyming names of presidents James J. Nance of Packard and Harold S. Vance of Studebaker are to be linked together in a merger of the companies they head.

For this reason, announcement of a Studebaker-Packard merger may be expected in either the very near future—or not for several years.

It is scarcely a secret that investment bankers are working toward a union of the two independents. Packard, under Mr. Nance, has admitted it was approachable, but under definite conditions. Studebaker, in contrast, has remained aloof in South Bend.

An alignment of either company with the newly formed American Motors appears to be out at this time. At least one, and possibly both, has told American that it must get its house in order following Nash-Hudson amalgamation before any merger would be considered.

But why is time so important? Why must a merger take place within the next few weeks, or be postponed indefinitely?

**Packard Must Choose . . .** The reason is that Packard has reached the crossroads—the point where it must know whether it is to be a part of a bigger unit or to go it alone on the program Mr. Nance has developed in his 2 years at Packard.

A little review is in order at this point to show exactly what this means.

When Mr. Nance moved to Packard from Hotpoint, merger was already an overworked word in Detroit. He acknowledged the

possibility, but not until Packard was back on its feet with a working program and a sound organization that would give them something to bargain with.

The Nance program is now just about completed and will go into full effect in the 1955 model year.

**Renovation Complete . . .** It represents one of the most complete reorganizations of a company ever seen in Detroit. Executives of the stuffy old Packard organization are mostly out of the picture. Exception is the excellent engineering staff that was subjected to little change at the top.

A complete modernization of production facilities is finished. The Utica, N. Y., plant is now



**MOCKUP** of dynamometer test room for Chevrolet's new engineering center was constructed to eliminate unforeseen bugs in final unit.

available for production of Packard's new V-8 engine, transmissions, axles, and other component parts.

Body program is less definite. Company still depends on former Briggs facilities now owned by Chrysler. But Packard is ready to make its own when facilities are available.

Company's government program is in very good shape. Packard is still in on the jet engine program and manufacturing diesels for the Navy.

**Costs Now In Line . . .** Most important factor: Packard now has its formerly much too high manufacturing costs in line with the best in the industry. Under Ray P. Powers, new vice-president in charge of operations, Packard slashed \$4½ million in excess overhead last year.

Company has also set up a new styling section, product planning department, tightened its sales organization. It has invested somewhat less than \$20 million in automatic machine tools for the new engine program and put another \$3 million into improving the Ultramatic transmission for 1955 cars.

With its 1955 models, Packard will have a completely restyled car, a new V-8 engine that will compete with any, and a vastly improved transmission. Mr. Nance is confident that on a realistic base of 80,000 to 100,000 cars, Packard can make money.

But the time for decision is at hand. Packard, admits merger considerations, but consistently states that it will not enter any program that will cost it one iota of identity. Nor would Studebaker.

**Would Bracket Market . . .** Immediate advantages of an acceptable union of these two independents (and the word "independent" means just that), are in marketing. Merger would give the com-

solidated company a much broader sales base—broad enough to bracket almost the entire market.

Because of the differences between Packard and Studebaker lines, as well as geographic separation, advantages of manufacturing common parts would be less compelling.

There are also the difficulties in a stock adjustment. Packard's shares are quoted at less than \$4 and Studebaker's at \$16. Both have labor contracts not considered advantageous in the industry. Packard is tightening up its loopholes and some concessions may be expected from the Studebaker local.

The ball can bounce any way, but it will have to be soon. Otherwise, future negotiations will have to wait for a new Packard model cycle.

## Wages:

**UAW takes 5¢ improvement boost . . . Cost 22¢ in 5 years.**

All over the industry, ½ million auto workers are already counting on a 5¢ per hour wage raise June 1 when the fifth installment of the annual improvement factor goes into effect.

It will be the last payment under the 5-year contract. It originally provided for a 4¢ annual increase but was amended to 5¢ last year when the contract was modified. It means a total increase of 22¢ over the contract's span. Other increases came from the famous escalator clause based on cost of living index.

A top manufacturing official told THE IRON AGE recently that when the contract was signed, he felt that automatically labor costs would rise 16 pct during the next 5 years.

This put the pressure on manufacturing to boost efficiency by at least that percent. Otherwise the contract would be a failure from management's point of view.

This clause, more than any other factor, has been responsible

for the tremendous strides in automation during the past 5 years.

With the productivity of the past few years, labor has not been concerned over labor saving devices. Management has been mildly disturbed over high tooling costs. Barring significant economic changes between now and contract time, it is doubtful if the improvement clause will be changed.

## Mergers Need Moneyed Suppliers

Merger talk between independents is of particular interest to parts suppliers looking for a tieup with any of the remaining auto companies:

What an auto company needs more than anything else is cash money, or operating funds, as it is more politely termed. Examples are the millions borrowed this past year by General Motors and Chrysler.

For this reason, suppliers with a few millions salted away in cash are much more desirable to

## Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
May 22, 1954..	134,269*	23,715*
May 15, 1954..	129,590	24,206
May 23, 1953..	140,060	22,287
May 16, 1953..	150,360	26,945

\*Estimated. Source: Ward's Reports

an auto company than one with assets that are more difficult to convert into cash. So if a company wants to join forces with an auto manufacturer, it should first offer its bank balance for inspection.

## Lincoln Gets Air Conditioning

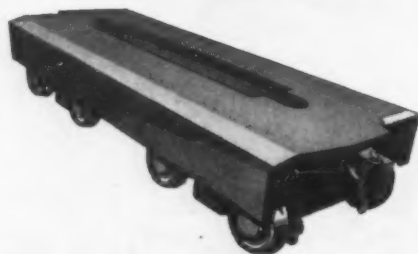
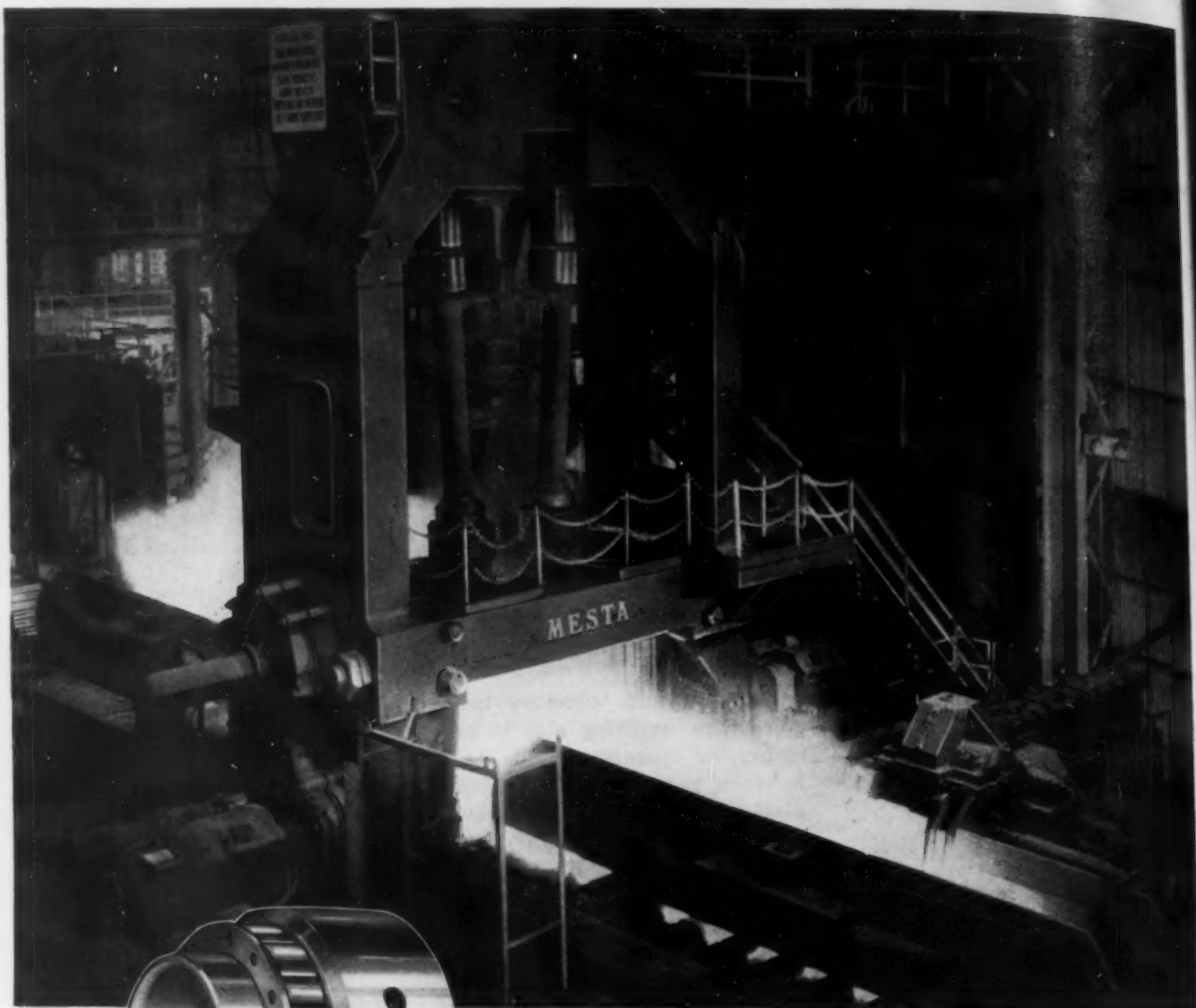
A new "comfort zone" air conditioning system is now available as optional equipment in 1954 Lincolns, at a suggested list price of \$575. Lincoln's unit almost rounds out the field with Buick, Cadillac, Oldsmobile and Pontiac, Dodge, De Soto, Chrysler, Nash, and Packard all having units of one type or another. Nash unit, at \$395, is lowest priced.

## THE BULL OF THE WOODS

By J. R. Williams







## At Fairless, too . . . THEY PUT OUR BEARINGS THROUGH THE MILL!

There's a lot that's new at U. S. Steel's fabulous Fairless Works. New ideas. New techniques. And new equipment . . . like the giant, 45-inch, 16,000-horsepower slabbing mill pictured above.

But one basic construction rule never changes, for steel-makers always protect their investment with *Hyatt* Roller Bearings. At Fairless, Hyatt Bearings are in charging cars, mill motors, ingot cars, cranes, and the bar mill—as well as in the tables and lineshaft of the mighty new slabbing mill.

So remember the "Fairless formula" whenever you make change-overs or buy new equipment. Be sure the bearing specifications call for Hyatts!

# HYATT

## ROLLER BEARINGS

STRAIGHT ☐

BARREL ☐

TAPER ☐

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

## This Week in Washington

### See Moderate Defense Spending Rise

War isn't foreseen this year but defense buildup will continue . . . Open-end contracts may be stepped up . . . Air Force buying expected to gain—By G. H. Baker.

Fighting war, as far as the U. S. is concerned, isn't in the cards this year. But the build-up in armed defenses is to continue—both at home and abroad.

Defense buying is to rise moderately in the months ahead. The tapering-off in contract-letting that started last summer is ended. If you hold an "open-end" contract with the Federal Government, there's a strong possibility that Washington will ask you to step up your output to a modest degree before autumn. And letting of new contracts, under study at the top level, is to gain momentum—particularly in Air Force procurement.

**Reserves Are Healthy . . .** New pace of activity won't be anything like the rate of procurement in the Korean war, of course. In the first place, this nation isn't at war and isn't going to be in the foreseeable future. In the second place, reserves and stockpiles of materials and equipment are substantial—a situation that unfortunately did not exist when the Korean war started.

Defense Secretary Charles E. Wilson makes it clear that the U. S. will not enter any war in southeast Asia on a "go it alone" basis. Here is Mr. Wilson's philosophy in this respect:

"We are a part of an alliance in the free world. We can't take sole responsibility to police the whole world. Even if we tried, we would be misunderstood."

**Will Ask Standbys . . .** Standby authority to invoke emergency price and wage controls will be requested by President Eisenhower, probably next January.

Control regulations, similar to

those in force during the Korean conflict, are now being readied by Stabilization Boss Glenwood J. Sherrard. After almost a year of conferences with industry and business, Mr. Sherrard soon will be ready to deliver specific regulations, he told THE IRON AGE.

Repeat performance is anticipated on Capitol Hill when Congress a year ago refused to give the White House standby authority and told President Eisenhower, in effect, the power would be granted only when it is necessary.

**Businessmen Resist . . .** Administration plan calls for the "Office of Stabilization" to have regulations covering each segment of industry and business so that those for selected industries constituting partial mobilization, or a complete set for all-out economic control, could be delivered whenever the White House asks.

Businessmen, although prepared to resist controls in any form,



### "Ordinary Acts of Violence"

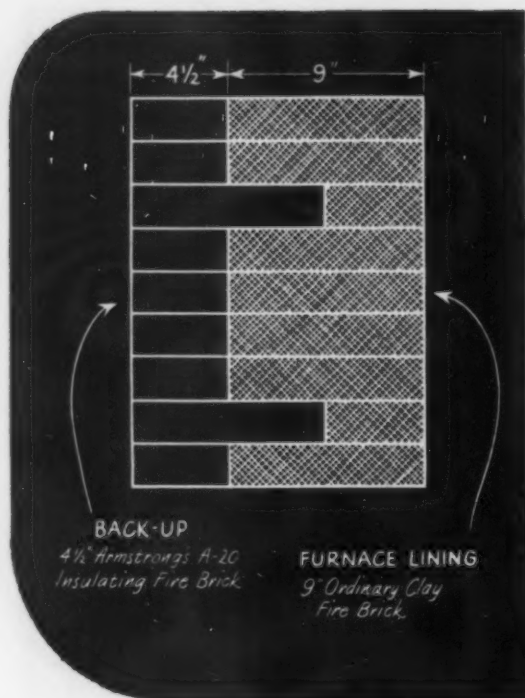
Going to work in the morning can be pretty dangerous in West Virginia. A federal court in West Virginia was recently told that non-union employees of the Elk River Coal & Lumber Co. were ambushed, shot, had bridges blown up under them, and were barricaded by road blocks. The non-union workers sought relief under the Federal Civil Rights Act, but the court told them that "ordinary acts of violence" are not offenses against the Federal Government, but offenses against the state. It advised them to take their case "promptly" to the state courts.

prefer, as the lesser evil, inventory-type controls holding stock on hand to historic levels to prevent inventory speculation and the resulting artificial shortages.

Government procurement of guided missiles and related equipment is to continue at the present slowed-down pace until a final decision is reached at the Pentagon as to what types—such as the highly-successful Matador—are to be concentrated upon. Air Force has cut back on guided missile contracts while it takes a close look at the detailed performance records of the missiles now in use.

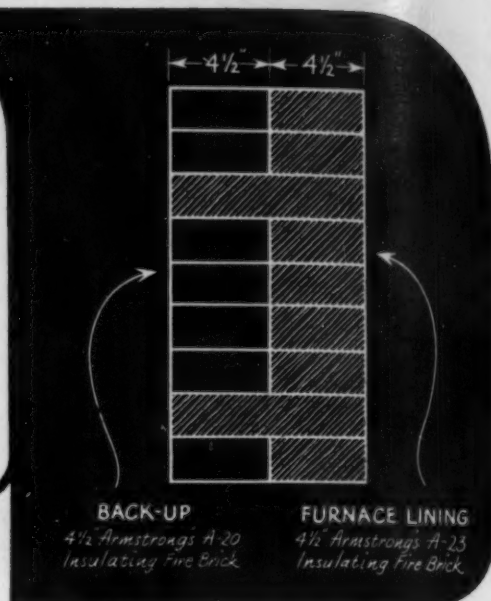
Defense Secretary Wilson last winter ordered an investigation of inter-service rivalry in the development of new missile devices with the purpose of trimming the least efficient gadgets out of the picture. Results of this study, which still are undisclosed, are the basis for the existing cut-back.

**Building Spurs Business . . .** The booming housing market—it's now at its highest point in more than 3½ years—is spurring the level of some businesses into



### Homogenizing Furnace

Cyclic operation. Charged when cool. Temperature then raised to 2150° F. and allowed to cool to 1400° F.



## Which furnace wall produces Faster Heating Cycles?

Here are two possible constructions for the wall of a homogenizing furnace.

In the design on the left, the furnace lining is regular fire brick backed up with Armstrong's A-20 Insulating Fire Brick. With this construction, the heat loss through the walls would be 595 BTU's per square foot per hour. The heat capacity, or heat storage, would be 51,232 BTU's per square foot of wall area.

Now, look at the construction of the wall on the right. The back-up insulation is still 4 1/2" of Armstrong's A-20's. But the original 9" of regular fire brick has been replaced with 4 1/2" of Armstrong's A-23 Insulating Fire Brick. These rugged insulating brick can be used directly exposed. Heat loss through this wall is only 412 BTU's per square foot per hour—a 31% decrease.

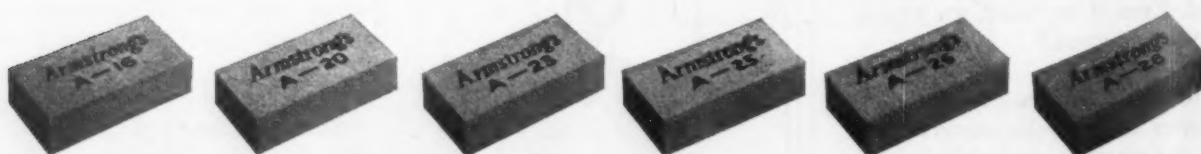
Even more important is the reduction in heat storage. The low specific heat of the Armstrong's

refractories in this second wall cuts the heat capacity to only 11,251 BTU's per square foot of wall area. This is a 78% decrease in the non-productive heat wasted in the furnace walls.

Result: faster heating cycles with increased production and lower fuel costs, because the furnace reaches its top operating temperature much sooner and cools off much more rapidly.

### Do you have a furnace problem?

Choosing the right brick calls for a sound knowledge of brick performance and furnace construction. That's why it's a good idea to call on the Armstrong engineer whenever you have a refractories problem. He'll study your conditions and help you select the best brick for your particular job. To have him help you, just call your near-by Armstrong office or write to Armstrong Cork Company, 2705 Susquehanna Street, Lancaster, Pennsylvania.



## ARMSTRONG'S INSULATING REFRACTORIES



sturdy new sales records. Sales this year of refrigerators, ranges, and other heavy appliances that go into new homes are now in line for reassuring increases.

Starts on new houses in April, were 14 pct ahead of the previous month. And the rise was general in all sections of the nation except in the Southeast. In the first 4 months of this year, work on more than 341,000 new privately-owned dwellings was started.

**Decline Is Over . . .** Federal Reserve Board reports now clearly show that the business decline has been halted and that the chart lines are now pointed up, not down. The board's adjusted industrial production index last week did not decline for the first time since last July. However, a slight decline in minerals production results from a less-than-seasonal increase in mining of iron ore—a reflection of reduced activity in steel plants.

## Tariffs:

**Ike will put off fight on tariff easing till '55.**

President Eisenhower, while conceding defeat for his liberalized trade-tariff program in this session of Congress, served notice he expects to get further tariff-cutting powers next January.

The President, in a letter to a Chicago camera manufacturer, said he would settle for a 1-year extension of the present Reciprocal Trade Act. But he asked Congress to approve several of the less controversial measures to strengthen foreign trade.

Reports are that Ike was advised not to press the program in Congress at this time because pressure from powerful high-tariff elements—using unemployment in several industries allegedly caused by present tariff structure as a weapon—might force a stiffening of trade regulations instead of a relaxation.

The President called on the

House Ways and Means Committee to hold extensive hearings this summer and fall and wants it to be ready early next year to report out a bill that would give him power to further reduce tariffs by 15 pct over 3 years. The Administration believes an easier foreign trade policy would be a powerful force to stop the march of world communism.

Mr. Eisenhower urged Congress to approve parts of the Randall Commission report to give liberal tax incentives for foreign investments; increase duty-free imports by tourists from \$500 to \$1,000; simplify commodity definitions and rate structures and improve customs administration and the antidumping law.

Other parts of the program which he said he would handle administratively include clarification of the Buy American Act; easier foreign exchange convertibility, clarification of the general agreement on tariffs for submission to Congress, and encouragement of more overseas investment.

## Will Build Particle Accelerators

Atomic Energy Commission will contribute \$1.2 million for construction of each of two heavy particle accelerators to be used in nuclear energy research.

One of these linear accelerators will be built at Yale University and the other at the University of California Radiation Laboratory at Berkeley.

Principal use of the Yale machine will be for studies of the

physics of heavy particle nuclear interactions. The machine of UCRL is intended primarily for nuclear chemistry research, which may lead to identification of new isotopes of known elements.

These devices will accelerate nuclei to an energy of approximately 10 million electron volts for each particle in the nucleus. This action will be sufficient to allow the nuclei to interact with even the heaviest known elements.

## Get New England Mill Extension

New England Steel Development Corp. is still eligible to get fast tax write-off privileges if it begins building its proposed steel mill before Oct. 30.

The corporation recently received from Office of Defense Mobilization a 6-month extension of the certificate of necessity it obtained last Oct. 30.

This action affords the corporation an additional half-year in which to find financial backing for projected construction of some \$20.5 million worth of steelmaking equipment.

## Industry Can Use Test Reactor

Industrial and other research organizations will be permitted to make limited use of the materials testing reactor (MTR) at the government's National Reactor Testing Station, Idaho Falls, Ida.

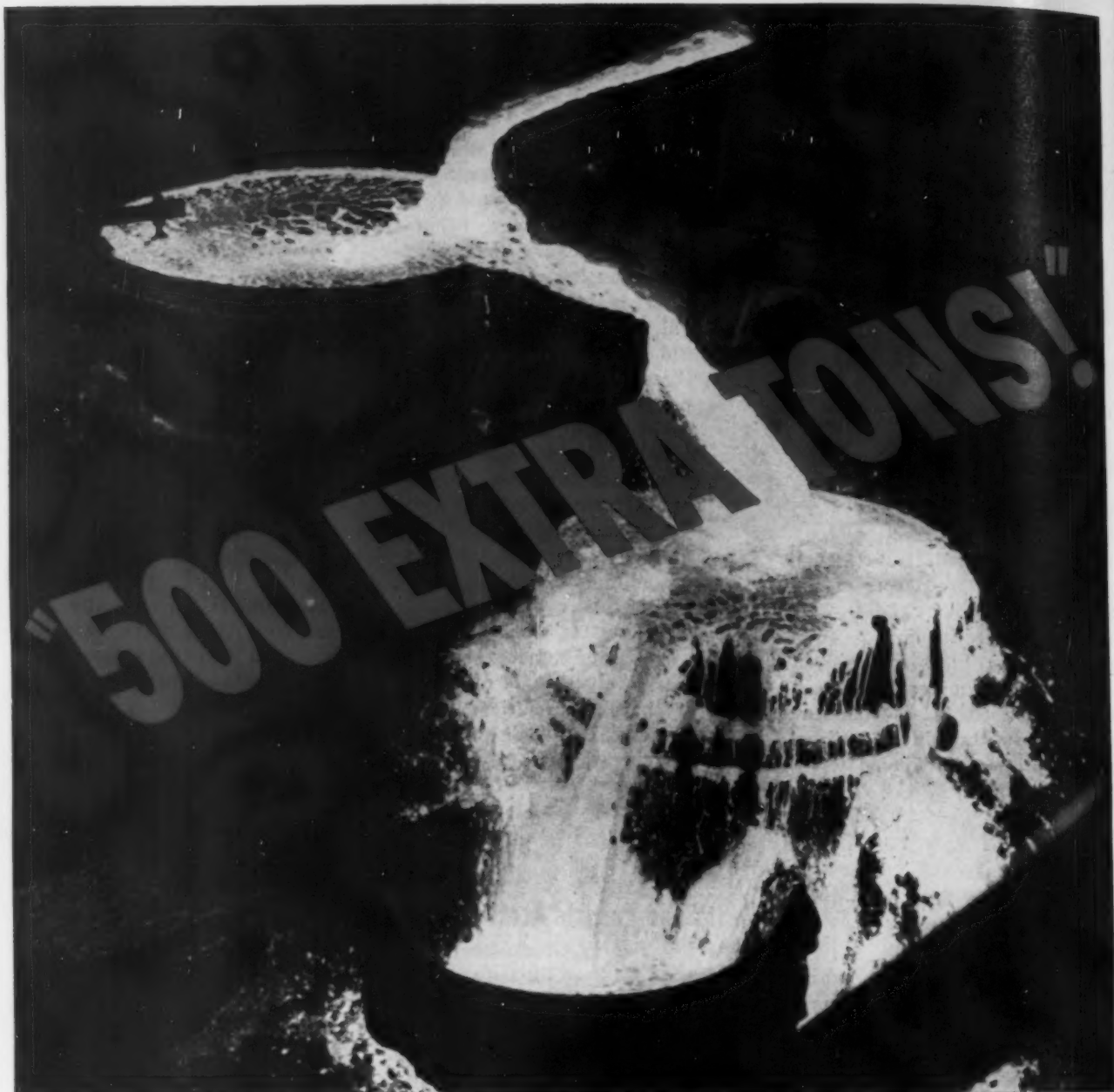
Atomic Energy Commission, which has just announced this new policy, considers the MTR a valuable research tool because it is a high intensity neutron source. It produces isotopes with a higher specific radioactivity than other AEC reactors which perform irradiation services for the public the commission indicated.

## Will Keep Eye on Discrimination

Ivan L. Willis, International Harvester vice-president, has been named by the White House to serve on the government Contracts Committee. One of the committee's assignments is to prevent racial discrimination by firms holding government contracts.



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**"Since being rammed with Permanente 165, this open hearth bottom produced 18,130 tons in a 30-day period — 500 more tons than this furnace ever has produced." How? Less down-time!**

This report from a leading steel mill is only one of the many proving how the superiority of Permanente 165 ramming mix results in increased production and lowered costs.

Permanente 165 is a high MgO periclase material of high refractoriness that is self-bonding by crystalline growth. Impurities are minimized because no sintering agents, no low melting fluxes are present.

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## West Coast Report

### Comeback For Cold-Finished Bars

**Second quarter sales up 10 pct . . . Manufacturers now get 70 pct of output compared to 35 pct 6 months ago . . . Urge caution on credit risks—By T. M. Rohan.**

The cold-finished bar business in the West—restricted to three Los Angeles producers—is starting to come back slowly after a sharp 6-month dip.

One producer said last week that second quarter sales are about 10 pct over the first quarter but business is now going on a completely different consumer spread. Traditionally about 65 pct went to jobbers and 35 pct to manufacturers and carload buyers.

At least manufacturers' confidence is increasing because market is now split 70 pct to plants and 30 pct to jobbers. About 40 pct of output goes into C1018 shafting and the remainder to screw stock and screw machine products.

**Deliver Cold Bars . . .** Added to developments last week was announcement by Republic Steel, which has a cold drawing mill in Los Angeles, that it was adding cold-finished bars to its delivered price method of sale this week.

Major western steel producers have thus far played down the cold-drawn bar business because they sell hot-rolled bars to processors. Bethlehem-Pacific, Kaiser and U. S. Steel's Pittsburg, Calif., works are all major factors in this, furnishing probably 65 pct of total used. Remaining tonnage comes from the Midwest and East as special bar quality shapes, not produced in the West.

Total theoretical maximum cold-finished bar capacity in Los Angeles is about 80,000 tons per year, presently at about 50 pct operation. Republic and Sierra Drawn Steel Corp. have about 80 pct of the capacity with Republic having the most.

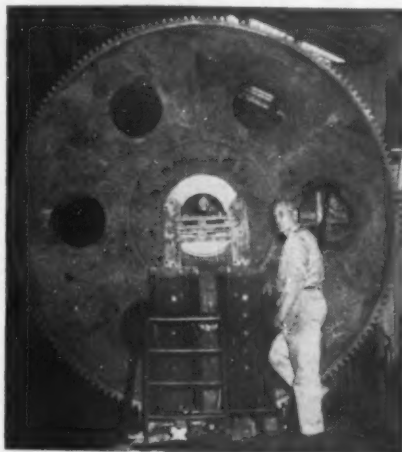
Pacific Tube Corp.'s cold drawn

bar division has about 15 pct in addition to its heavy tube production. Sierra, in addition, has a turning and polishing plant in Seattle which processes bars to 6.5 in. for Pacific Northwest and Alaskan lumber mills which have heavy shafting equipment.

The California producers can meet Chicago competition in the three coastal states but generally are underbid east of there. On recent bids for shafting in El Paso, Tex., for example, one Los Angeles producer faced a \$1.08 per cwt freight bill and ended up \$20 per ton over the price from Chicago.

**Watch Credit Risks . . .** Bulk of discussion at the National Assn. of Credit Men meeting in San Francisco last week revolved around marginal credit risks and how far to go. At discussions in the Iron & Steel and Non-Ferrous Metals Sections almost all questions concerned how to evaluate and help marginal risks.

S. R. Crary, Bethlehem-Pacific,



**BULL GEAR**, weighing more than 5½ tons, for gold-dredging machine gets final machining at Yuba Mfg. Co., Benicia, Calif.

urged caution in taking on risky accounts. He said that passing up obviously poor ones does just as much good as increasing sales. He added that credit men generally were aware of the inventory build-up last year but were accused of trying to start a depression when they told production men to slack off.

Some warehouses were even leasing outside space to pile up material, he said, and that was the straw that broke the camel's back. "But if we had taken care of marginal risks in the sellers' market, we wouldn't have to go out and get them now."

G. B. Kay of American Smelting & Refining, Whiting, Ind., said collections began to deteriorate about a year ago but lately have taken on new vigor.

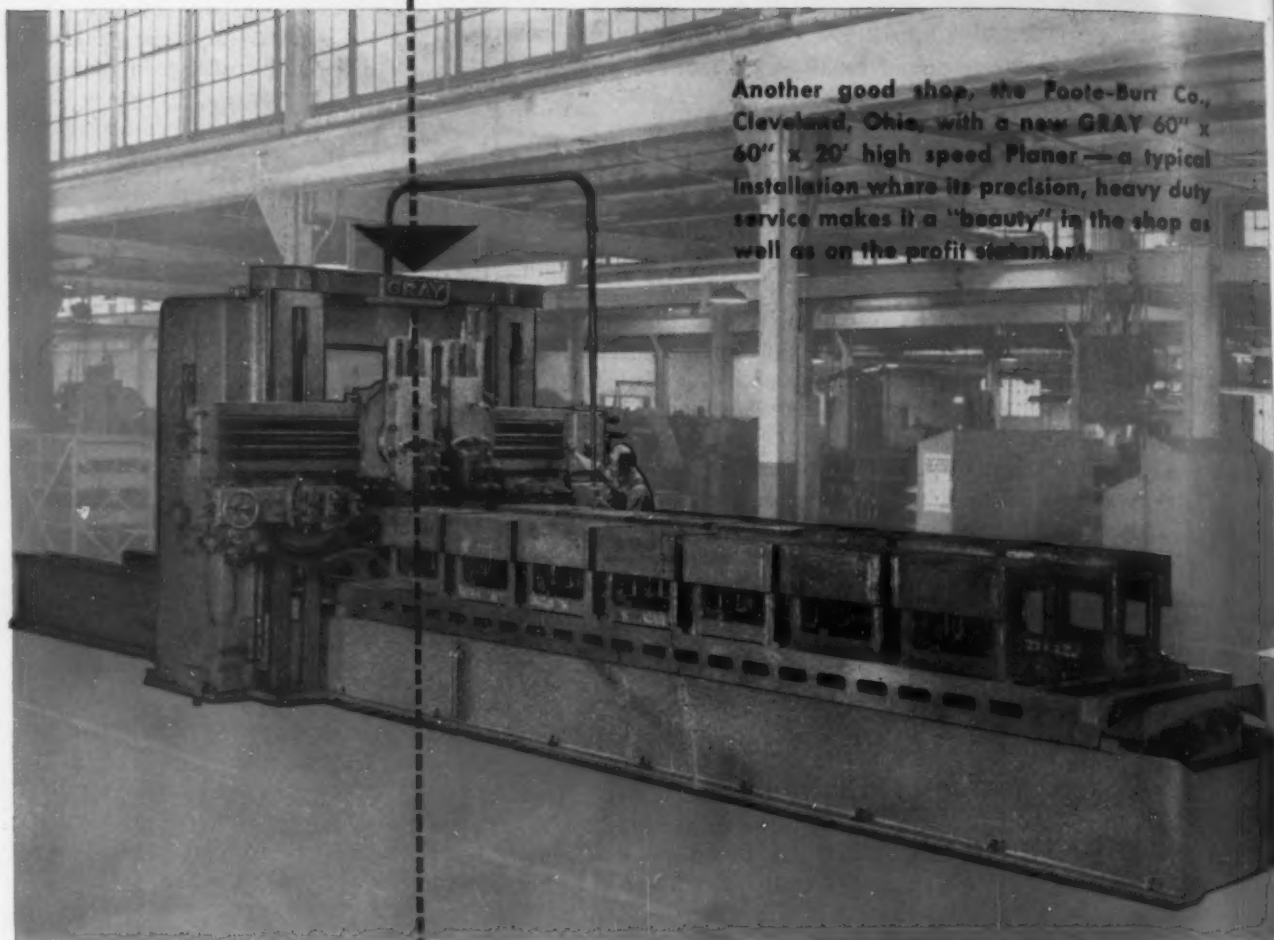
F. L. Daniels, assistant vice-president of Bank of America, said his bank did \$72 million business in accounts receivable financing in March 1954, last month for which figures were available. For February it was \$61 million and January \$64 million. "This doesn't indicate they're going broke," he said, "but are adapting themselves to conditions as well as possible. Incidentally, he added, "we turn down 70 pct of applications for accounts receivable financing."

**Better Nuts, Bolts . . .** A new press for extruding carriage bolts prior to threading has been installed at Bethlehem-Pacific's bolt and nut shop. The unit permits the plant to turn out carriage bolts with more uniform, stronger threads held to closer tolerances. The improved threading method is expected to improve production efficiency, as well as increase quality.

The press extruded 550,000 carriage bolts in its first 4 weeks of operation. It operates at 90 bolts per minute and can also be used for both trimming and extruding machine bolts in a single operation.



# the sign of a good shop



Another good shop, the Foote-Burr Co., Cleveland, Ohio, with a new GRAY 60' x 20' high speed Planer—a typical installation where its precision, heavy duty service makes it a "beauty" in the shop as well as on the profit statement.

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# Machine Tool High Spots

## Builders Hawkeye Surplus Sales

**Machine tool builders defense committee makes certain government doesn't auction equipment vital to defense . . . Few leaks in screening program—By E. J. Egan, Jr.**

Prospective machine tool buyers, hopefully scanning government surplus lists for post-Korean bargains, are apt to be disappointed. Disposal of valuable equipment hasn't been and won't be anything like the deluge that followed World War II.

Wholesale auctioning of government-owned tools in the late 40's seriously dissipated the country's defense production reserve. And machine tool builders found it hard to compete with U. S. bargain counter prices, had to retrench all along the line.

**Hurt Defense . . .** When the Korean emergency hit, the shortage of tools and production capacity crippled desperate hurry-up efforts. Remembering these sober facts, a Permanent Defense Committee of the National Machine Tool Builders' Assn. has been watching government surplus sales like a hawk.

The committee suspected that certain recent actual and proposed sales of surplus metalworking equipment included some really important defense production tools. Committee members requested, and were granted, an audience with Defense Dept. officials to discuss possible "leaks" in the surplus screening setup.

As it turned out, some items that could possibly have been withheld from disposal lists were auctioned off. But these cases have been few and far between, according to Defense Dept. spokesmen.

Actual defense value of the tools sold is open to question, as a matter of fact. Survey teams, including machine tool industry representatives, have spot checked some of these sales, found everything OK.

**Guard Easing of Rules . . .** The NMTBA committee is mainly interested in preventing any gradual relaxation of surplus regulations. The rules specify that surplus government machine tools must be screened by all military departments and branches as well as other federal agencies. But in some instances outlying depots and districts have acted on their own to clean out their surplus inventories.

Dept. of Defense assured machine tool builders that the screening procedure would be tightened up. All potential surplus sources would be readvised of the strict regulations.

**Show Foreign Tools . . .** Foreign machine tools of all types attracted much attention at the recent American Society of Tool En-

gineers exposition in Philadelphia. Reports on the success of these exhibits in terms of actual floor sales range from very poor to very good.

Foreign builders and their U. S. and Canadian distributors apparently consider such exhibits worthwhile. Reports indicate that West German metalworking equipment will be widely displayed at the forthcoming Canadian International Trade Fair. The show will be held in Toronto from May 31 to June 11.

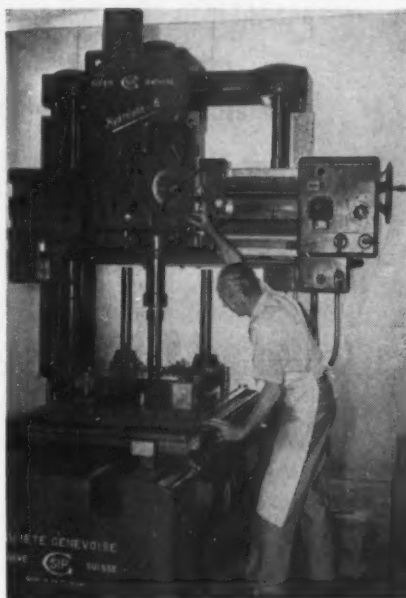
**Germany Moves In . . .** West German exports to Canada have been rising steadily. Dollar value of these shipments for the past 4 years adds up like this: 1950—\$181,000; 1951—\$530,000; 1952—\$1,931,000; 1953—\$2,207,000. With aggressive salesmanship West German builders expect to triple their Canadian sales during the next 2 years.

Size of the foreign threat to U. S. builders is always an interesting question and figures from the West German Machine Tool Builders' Assn. indicate competition from this country at least is softening, after a spectacular rise following World War II.

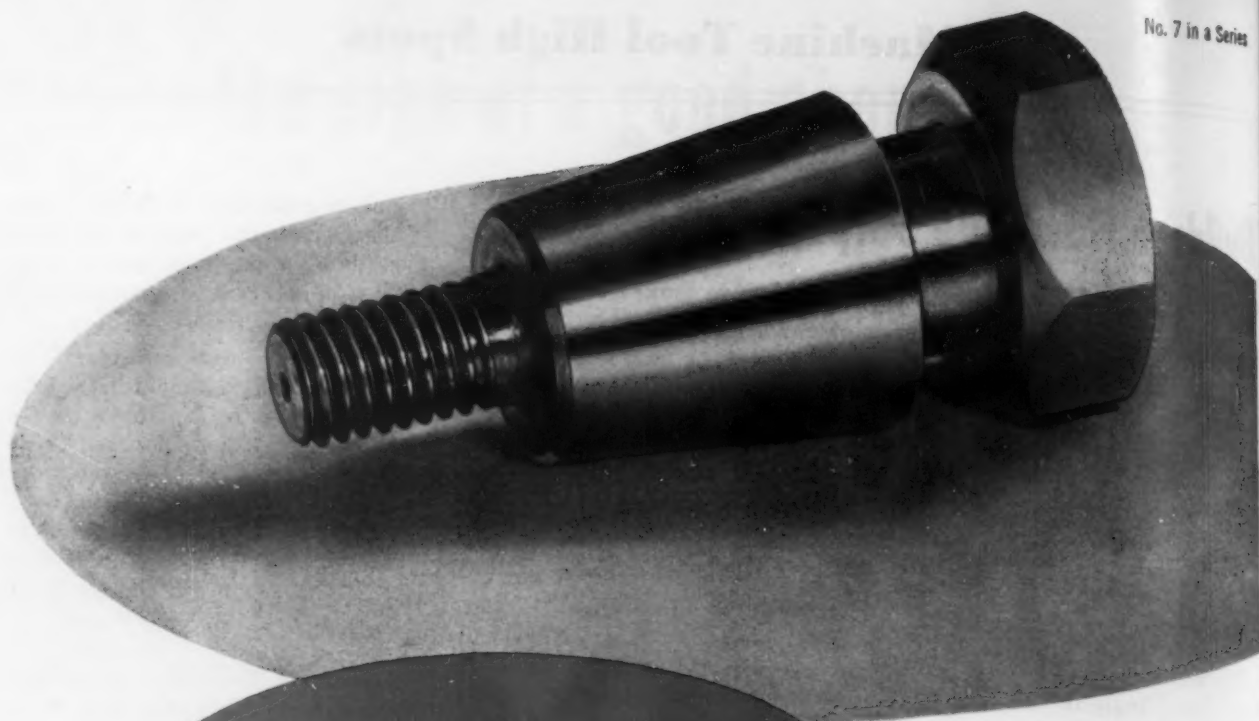
Total exports of West German machine tools in 1952 were \$139.9 million. Of this amount, \$17.1 million went to customers in the U. S. Last year total West German exports dipped to \$135.8 million with a corresponding drop to \$12.7 million in sales to U. S. buyers who could buy more freely from American firms.

West Germany imported machine tools worth \$9.5 million in 1952; including \$2.1 million in U. S. equipment. Last year West Germany imported \$11.8 million in machine tools with \$3.3 million of the total coming from the U. S.

U. S. exports of machine tools had the edge on West Germany's shipments abroad for the past 2 years. U. S. totals were: 1952—\$155.6 million; 1953—\$149 million.



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# *The* **Iron Age**

## **SALUTES**

*Edward T. Ragsdale*

Engineer, skilled craftsman, top administrator, he makes sure that better Buicks are built.



SEVERAL years ago, Rags Ragsdale, general manufacturing manager of GM's Buick Div., asked his wife why she insisted on driving a convertible when she never put the top down.

Mrs. Ragsdale replied that she liked the convertible's sporty lines but didn't like the wind in her hair. Rags promptly designed and built a steel top fitted with a rear window and welded it onto a convertible body. Today, the hardtop convertible—Buick calls it the Riviera—is one of the industry's best sellers.

Rags has an enviable experience backlog of 37 years in the industry to help him lick tough design, engineering and production problems. Starting as a tool designer with the old Maxwell Motor Co., he worked for a time as a body designer at Pierce-Arrow, then joined Buick in 1923 as a draftsman in the body division. Since then he's worked up the engineering ladder, took over his present position in 1949.

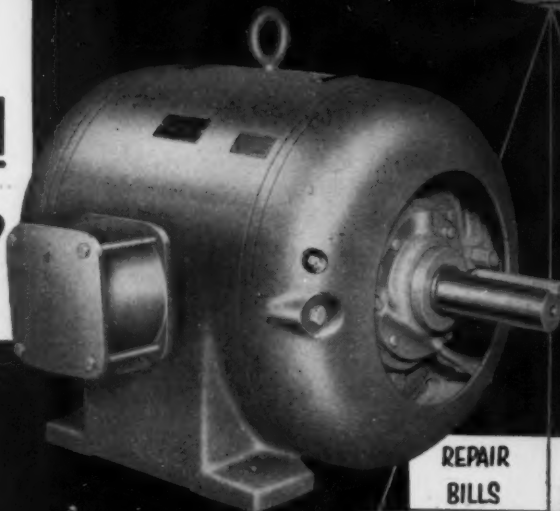
As manufacturing chief at Flint, Rags is responsible for meeting ever-growing production schedules; Buick is now the industry's third best seller. Also he must see to it that the Air Force gets its jet engines on time.

Rags starts his working day at 7:30, bears down on a job until he has it whipped into shape. And he believes that the boss should work harder than any member of the team.

Relaxation is no problem for Rags. He heads for the basement workshop to turn out beautiful furniture for his home. Other activities for which he manages to find time are presidency of the Flint Chamber of Commerce, golf and poker games with friends.

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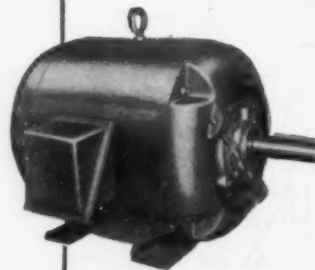
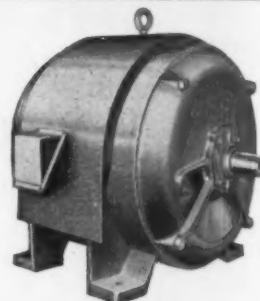
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THE IRON AGE

# The Iron Age

## INTRODUCES

**R. H. Bradley**, elected president, INTERNATIONAL HARVESTER CO. OF CANADA LTD., Hamilton, Ont.

**Ralph L. Leadbetter**, elected president, BURGESS - MANNING CO.

**Frank E. Hines**, named executive vice-president and director of engineering, RUGE - deFOREST INC., Cambridge, Mass.; **Haskell Ginns**, appointed vice-president in charge of electronics; and **Edgar J. Jones**, appointed vice-president in charge of sales. It was erroneously reported in this column that the appointments were by the Baldwin-Lima-Hamilton Corp. in the May 13 issue.

**Robert M. Norton**, appointed vice-president HANSON-VANWINKLE MUNNING CO., and **Myron B. Diggin**, appointed assistant vice-president.

**B. B. Countryman**, named vice-president, Purchasing Div., MINNESOTA MINING & MANUFACTURING CO.; and **I. R. Hansen**, elected assistant treasurer.

**Howard F. Park, Jr.**, elected vice-president-sales, GENERAL STEEL CASTINGS CORP., Granite City, Ill.; **J. Harvey Johnston**, elected vice-president; **Richard T. Risk**, elected treasurer; and **George K. Hoblitzelle**, becomes secretary.

**H. Monteith Albers**, elected to board of directors and appointed to Executive Committee, KENSINGTON STEEL CO., Chicago.

**Anton J. Kuhn**, elected president and director, PEERLESS STEEL EQUIPT. CO., Philadelphia; and **Conrad Bergmann**, becomes vice-president and director.

**R. F. Allen**, elected vice-president in charge of Buffalo Steel Div., H. K. PORTER COMPANY, INC.

**Eugene B. Hotchkiss**, named a vice-president, VITRO CORP. OF AMERICA, New York.

**I. W. Best**, named an assistant vice-president, WEIRTON STEEL CO.; **H. J. Ashton**, named assistant district sales manager; **L. P. Brueckel**, becomes assistant district salesman; and **A. P. Watson**, was transferred to San Francisco as sales representative.

**John H. Schultz**, elected assistant secretary, BORG - WARNER CORP., Chicago.

**Wesley H. Douglass**, appointed assistant to vice-president, NATIONAL CAN CORP.

**Ernest E. Kugel**, elected a member of the board of directors, HYDRORESS, INC., New York.

**Kenneth M. Huddleson**, appointed comptroller, Plymouth Div., CHRYSLER CORP., Detroit. **George T. Higgins**, appointed assistant secretary.

**R. A. Hastings**, becomes head of the Sales Dept. of a new division, LINDBERG ENGINEERING CO., Chicago.

**Ford R. Snyder**, elected a director, HICKMAN, WILLIAMS & CO., Chicago.



**JAMES M. DARBAKER**, appointed senior vice-president, Copperweld Steel Co., Pittsburgh.



**CHARLES W. SANFORD**, elected vice-president-manufacturing, Jack & Heintz, Inc., Cleveland.



**T. R. DREYER**, appointed divisional vice-president and general manager, American Machine & Foundry Co., Manufacturing Div.



## Personnel

**T. G. A. Sillers**, promoted to chief engineer, Switchgear Dept., **ALLIS-CHALMERS MFG. CO.**, Milwaukee.

**William E. Dorney**, becomes a Chicago field engineer, Powdered Metal Products Div., **YALE & TOWNE MFG. CO.**; and **Walter S. Heffron**, also becomes a Chicago regional field engineer.

**O. E. Williams**, named research and design engineer, Tool Div., **BONNEY FORGE & TOOL WORKS**, Allentown, Pa.

**Walter J. Bernardy**, appointed office manager, Cleveland Sales Branch, **CRUCIBLE STEEL CO. OF AMERICA**, Pittsburgh.

**Kenneth T. Snyder**, appointed western regional sales manager, **THE ATLAS MINERAL PRODUCTS CO.**; and **Eugene Kirkpatrick**, appointed eastern regional sales manager.

**Henry W. Doctor**, appointed district sales manager, Tubular Products Div., **THE BABCOCK & WILCOX CO.**, Beaver Falls, Pa.

**Charles H. Scott**, appointed district sales manager, Detroit, **BLISS & LAUGHLIN, INC.**

**John S. Coppage**, becomes manager of sales Chemical Service Div., Sales Dept., **THE PERMUTIT CO.**, New York.

**Richard K. Stevens**, appointed industrial relations manager, Chicago district. **U. S. STEEL CORP.**

**Ralph T. D. Montagu**, appointed sales manager, Metals Processing Div., **CURTISS-WRIGHT CORP.**

**W. L. Ashlock**, appointed regional sales manager, New Haven, Conn., plant, Metals Div., **OLIN INDUSTRIES, INC.**; and **H. F. Grote**, appointed regional sales manager, Cleveland.



**KENNETH W. CUNNINGHAM**, elected a vice-president, **Ohio Ferro-Alloys Corp.**



**JERRY G. PRITZ**, elected vice-president, **Ohio Ferro-Alloys Corp.** of Canton, Ohio.



**HARRY K. TAYLOR**, named assistant vice-president, operations, **Jessop Steel Co.**, Washington, Pa.



**JOHN E. AULT, JR.**, elected comptroller, **Jack & Heintz, Inc.**, Cleveland.

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### Personnel

*Continued*

**Lawrence C. Connolly**, appointed manager of the Boston sales office, Fielden Instrument Div., ROBERTSHAW - FULTON CONTROLS CO.

**J. W. Marrinan**, appointed assistant general manager of operations, SUPERIOR STEEL CORP.

**W. E. Mullestein**, appointed general manager of sales, LUKENS STEEL CO., Coatesville, Pa.; and **Ben R. Slocum**, appointed manager of Personnel administration.

**Lloyd A. Rager**, appointed advertising manager, LETOURNEAU-WESTINGHOUSE CO.

### OBITUARIES

**Lloyd D. McDonald**, 60, executive vice-president, The Warner & Swasey Co., Cleveland, suddenly of heart failure recently.

**Charles R. Crane II**, 61, vice-president and director, Crane Co., Chicago, suddenly at his home recently.

**Henry Dexter Sharpe**, 81, chairman of the board, Brown & Sharpe Manufacturing Co., Providence, R. I.

**Louis J. Wunsch**, 65, secretary and assistant treasurer, Rome Strip Steel Co., recently after an illness of nine months.

**Beeason J. Schneider**, 43, plant superintendent, Central Safety Signal, Peru, Ind., a division of Equitable Powder Manufacturing Co., a subsidiary of Olin Industries, Inc.

**Daniel C. Reagan**, purchasing agent, Ohio Seamless Tube Div., Copperweld Steel Co., Shelby, Ohio.

**Isaac Alfred Stone**, 59, chemist, Westfield plant, Tennessee Coal & Iron Div., U. S. Steel Corp., recently in Birmingham, Ala.



*A metalworking first—*

## High Production Mill Rolls Wide Magnesium Plate

♦ Bridging the gap between handmill rolling by Dow Chemical Co. of comparatively small sheets and plates at Midland, Mich. and rolling big magnesium plates and coils up to 84 in. wide at Madison, Ill. has involved: (1) nearly 20 years of research, (2) development of rolling mill equipment having unusual power and flexibility, (3) a multi-million dollar investment backing the future of magnesium.

♦ The new 84-in. 4-high hot mill at Madison is used both for breakdown and semifinishing . . . No reheating is required while rolling from 10 to 0.200 in. . . 2000-lb magnesium ingots are cast continuously.

♦ Availability of coils and large plates is expected to open new markets for magnesium where weight saving, high strength and outstanding machinability are important.



**By W. G. Patton**  
Asst. Technical Editor

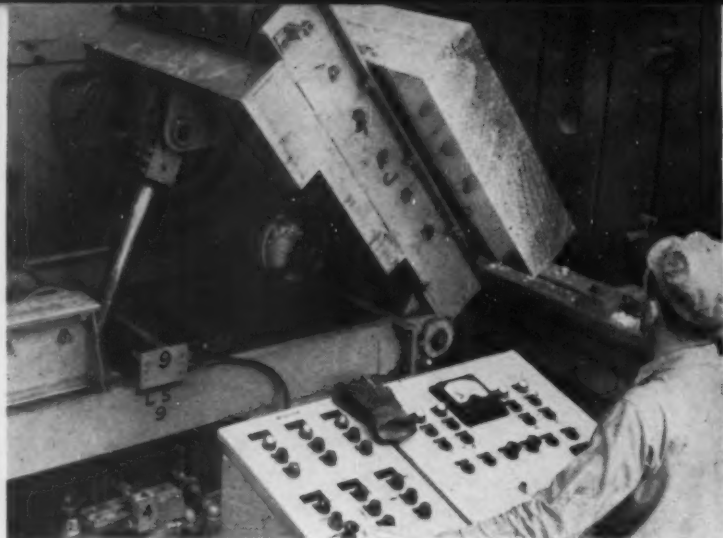
♦ OCTOBER 1953 marks an important milestone in the history of the metalworking industry. On Oct. 15, at Madison, Ill., Dow Chemical Co. rolled the first large magnesium ingot to wide plate on a high production mill. The new 4-high United hot mill at Madison is delivering wide, flat rolled magnesium products including coils in quantity for the first time in the history of the metalworking industry.

The significance of this accomplishment can hardly be overestimated. The event followed the first commercial production of cast magnesium products by 30 years. Madison came 23

years after the first pilot production of wrought magnesium products at Midland, Mich.

The installation of the new casting, extrusion and rolling equipment at Madison was preceded by many years of research in the laboratory. During World War II, magnesium was rolled on standard steel mill equipment at Butler, Pa. and at Weirton, W. Va.

Metallurgists agree that the step from pilot plant to commercial production may create many new operating problems. The forward step taken by Dow involves (1) a metal that is being cast continuously for the first time in large sizes, (2) precise metallurgical and production control of large quantities of magnesium metal, (3) the initial attempt at large scale mechanization of production of magnesium products, (4) the first big, high-powered reversing hot mill that will produce coils as well as plates. When these things are considered, it becomes clear that the new 1,500,000 sq ft Dow plant at Madison represents a tremendous forward advance in metals technology.



INGOT is shown entering surface scalping machine where  $\frac{1}{4}$  in. is removed top and bottom.

During the first year of operation of the Madison plant, the output of flat rolled magnesium products will exceed, for the first time, the total output of cast magnesium products. Many metallurgists regard this as an indication that magnesium metal has "come of age."

In the years immediately ahead the volume of available flat rolled magnesium products will be increased several times. Many new magnesium products, heretofore unavailable to industry, will become available for the first time in commercial quantities.

Selection of a continuous casting process for magnesium offers a number of advantages. These include (1) uniform metallurgical quality, (2) continuous flow of metal, (3) stabilized casting conditions, (4) increased output per sq ft of floor space, (5) lower production costs, (6) improved quality control.

#### Cross section increased 6 times

To appreciate fully the forward step being taken by Dow Chemical Co. at Madison, it is necessary to know that the cross section of the magnesium ingots has been increased 6 times as compared with the Midland operation. Weight of the ingot has been increased 18 times. At Midland, ingots produced were 12 in. x  $6\frac{1}{2}$  in. x 30 in. The ingots being rolled at Madison measure 76 in. x 41 in. x 11 in. Whereas the largest plates produced at Midland weighed 120 lb, plates weighing up to 1800 lb will be made at Madison.

In addition to the problem of maintaining internal soundness, the surface of the continuously cast, larger ingots must be free from surface cracks and other defects. Precise control of the casting rate and the cooling rate is essential. Considerable development work on molds necessarily preceded the new Madison installation.

Quality control of chemistry is indispensable in a large installation like the Madison magnesium plant. Pneumatic tubes provide prompt

delivery of specimens from the melting floor to the laboratory. In addition to the usual chemical analysis facilities, the laboratory is equipped with a Dow-Baird direct reading spectrometer that checks up to 20 elements in less than half a minute. This is the first spectrometer to provide direct reading of Fe and Ni in Mg alloys which were formerly determined by the time-consuming plate method.

Each batch of magnesium is carefully checked as melting and alloying are progressing. At least one sample is taken for every 2000 lb of magnesium cast. Regular sampling schedules have been set up at Madison.

When the continuously cast, continuously moving magnesium ingot reaches a certain length a rotary metal saw moves in automatically to cut the ingot to length. Sawing must be carried out while the ingot moves but without disturbing the casting operation. Clamping must be accurate and downward movement of the saw and the cast must be coordinated.

#### Cast six different alloys

Rate of downward movement of the saw can be changed, of course, to accommodate a different casting rate. All controls are hydraulic. Rate of movement of the saw is 2 in. per min. and upward. At the present time, at least 6 different commercial alloys are being cast continuously at Madison.

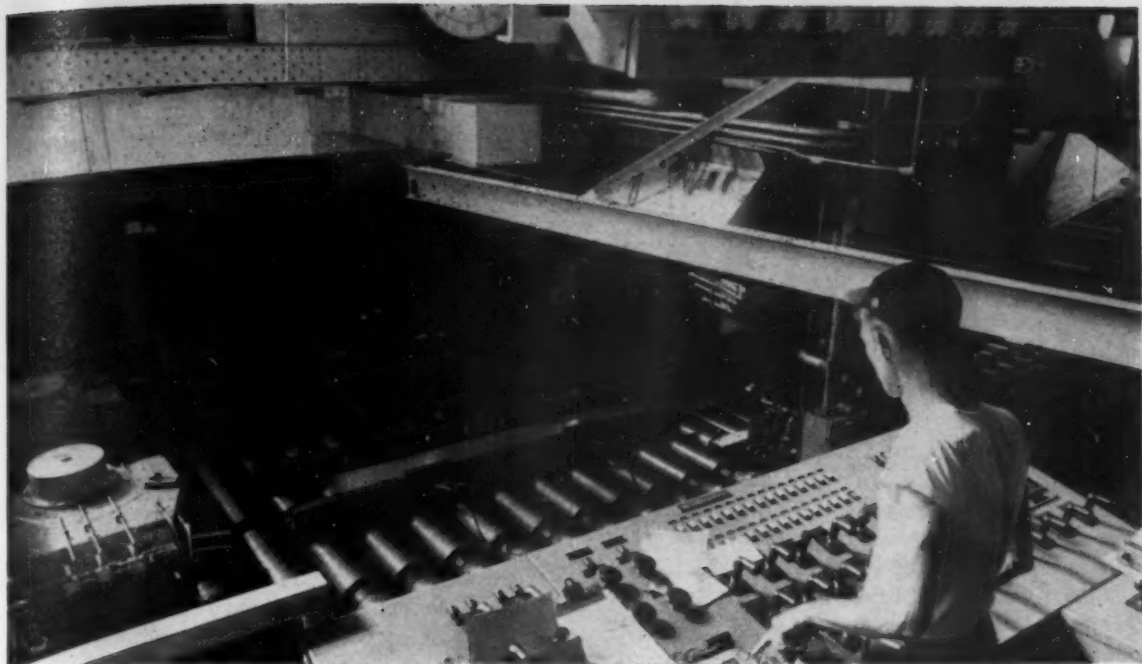
Following sawing of the ingot, a 2 in. slice is taken off the bottom. This sample is carefully examined for cleanliness. Grain size is also checked and the surface is visually examined for cracks or other defects.

In the scalping department a huge Ingersoll face miller is used to remove surface metal to a depth of  $\frac{1}{4}$  in. or more from the top and bottom faces of the ingot. In this large milling machine, the ingot is clamped hydraulically in an upright position to the table which travels past a 48 in. rotating head. Approximately 40 carbide tipped cutters are inserted in the cutting head. This huge milling machine can scalp  $6\frac{1}{2}$ -ft long ingots and can remove in excess of  $\frac{1}{2}$  in. in a single pass, at rates up to 15 ft per min.

Special hydraulic handling equipment entirely eliminates the use of manual effort during this operation. Following milling of one face, the ingot is turned to permit milling of the remaining face. The partially milled ingot is then carried by powered roller conveyor to the Ingersoll edge miller.

A special form milling cutter equipped with carbide-tipped tools is used for edge milling. Again, a traveling table is employed. Feeds up to 10 ft per min may be used.

After the first pass, the ingot is carried by another roller conveyor, turned automatically, turned again and cross-carried back to the entering conveyor. Following milling of the remaining edge of the ingot, the ingots are com-



New 84-in., 4-high hot mill at Madison is used for breaking down ingot and semifinishing.

pletely examined with the aid of a reflectoscope.

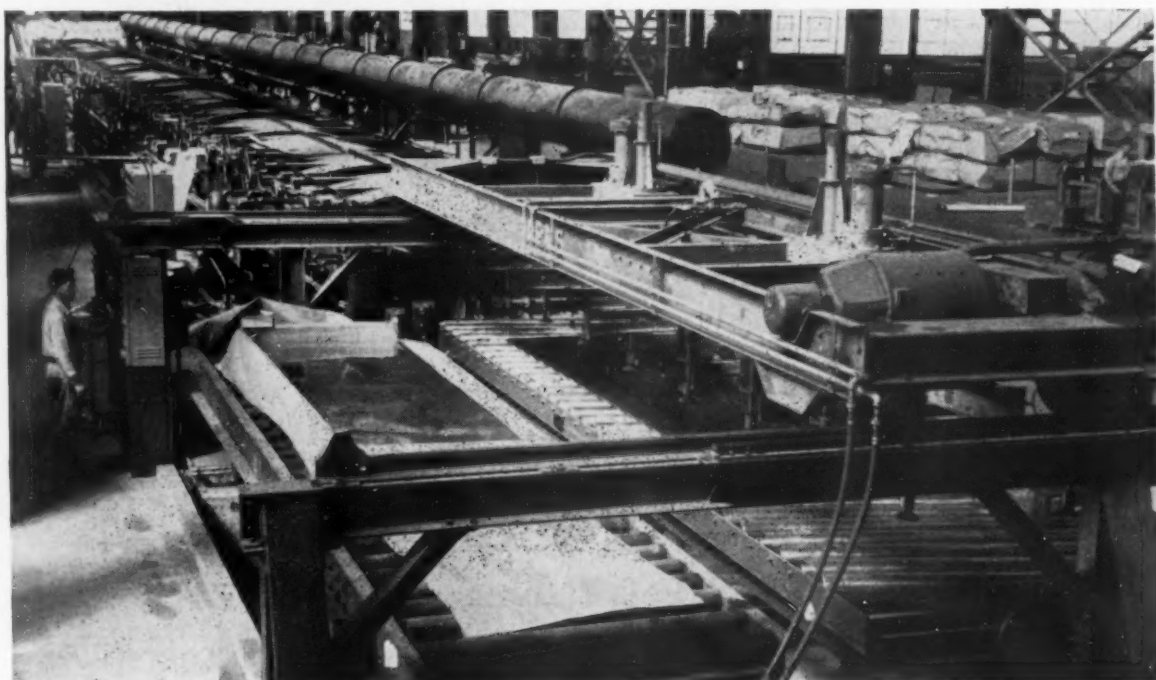
The scalloped ingot is then taken to a storage zone by a mill wagon to await loading into the furnace. Special hydraulic devices have been designed to lift and insert ingots into the 2-zone heating furnace. Heating temperature is in the range of 800° to 900° F, depending on the alloy.

Ingots are heated rapidly in the first zone, to within a few degrees of the desired temperature. They are then transferred into a holding

or soaking zone where they remain until required for rolling.

The heating furnace is gas fired. Temperature and holding time are carefully controlled to avoid scaling. Precise temperature control is essential since some magnesium alloys are susceptible to hot shortness. On signal from the roller operator, heated ingots are delivered on a powered roller conveyor and carried to the rolling table.

The new mill at Madison was designed by



CONTINUOUS acid pickling line for cleaning and treatment of magnesium sheet and plate.



**"By steel mill standards the new 4-high reversible mill is unusually powerful . . ."**

United Engineering and Foundry Co. exclusively for the purpose of rolling magnesium. Judged by steel mill standards, the new 4-high reversible mill is unusually powerful. For example, the 84 in. hot mill has 20 hp per in. per 100 ft per min.

Construction of the Madison mills also differs somewhat from steel mill rolling equipment. The 84 in. hot mill, for example, uses the same mill for breakdown work and for semi-finishing. This means that the mill is used as a reversing unit for breaking down the cast ingot to a thickness of 0.200 in., in which case it is used with full tables. Maximum speed at this stage is 600 ft per min.

The same mill may also be used for semi-finishing. It is, therefore, provided with a coil box which is placed underneath a section of the table on the entry side of the mill. To expose the coil box for rolling gages lighter than 0.200 in., the entry table is simply tipped back out of the way by hydraulic lifts. Maximum rolling speed at this stage is 1100 ft per min.

Due to the double purpose of the 84 in. hot mill, it is provided with double screwdown drives, providing necessary high speeds for roughing work and slower and more accurate speeds for finishing.

Breakdown is done on the hot reversing mill. Slabs are rolled from 10 in. down to 0.200 in. without reheating. Sheet is coiled on the final pass.

Rolling starts at about 800°F and continues down to about 600°F.

Subsequent rundown passes on wide coils may be taken on the breakdown mill down to 0.100 in. to 0.050 in. This rolling is also done hot.

#### **Mill has double screw down drives**

Metal is then transferred to the various finishing mills and rolled down to desired gage. Coils go through a heating furnace after each reduction. Metal is reheated to from 300° to 700°F, depending on the product and the properties desired.

The coiler for the 84 in. hot mill is similar to coilers employed on conventional steel mills.

Rolling practice generally follows steel mill practice but there are important differences in the techniques employed. For example, in rolling magnesium, after the initial reduction, ingot reductions are generally increased percentage-wise. From 10 to 20 passes may be required to reduce an ingot to, say, 0.200 in.

The 84 in. hot mill is powered by a 6000 hp

motor. Peak rating of the drive motor is 12,840 hp.

The mill is equipped with powerful 1500 hp edging rolls which are located on the entry side of the mill. Edge rolls minimize the possibility of edge cracking and help eliminate a trimming operation.

The powered rolling table is 400 ft long. This permits plate and coil rolling on the same mill.

#### **How ingots are cross-rolled**

Cross rolling of ingots is accomplished by reversing half of the conveyor rolls between edging rolls and the 4-high mill. One set of rolls may idle or be reversed while the other set of rolls is turning the ingot 90 or 180 degrees. Cross rolling, of course, is necessary for production of sheets as wide as 72 in.

The 84 in. cold mill is arranged for rolling tread plate. Other than this, design of this mill follows conventional lines. Plates up to 24 ft long are being rolled at Madison in gages ½ in. and heavier.

In addition to the 84 in. hot breakdown mill, the Madison plant also has 84 in., 66 in., 64 in. and 36 in. finishing mills. In each case, gas-fired heating furnaces are integrated with the finishing mill. Powered roller conveyors handle the plates or coils between operations. By the use of elevated temperatures for finishing operations, maximum reduction per pass and desired properties and surface finish are obtained. Finishing temperatures as high as 700°F have been employed successfully.

#### **Pickling is done on sheets**

Unlike steel mill practice where coils are pickled in continuous strips, pickling at Madison is performed on cut-to-length sheets. This requires the use of powered rolls to carry the sheets through the 175 ft long pickle line. Two basic pickling solutions are used. The Madison setup includes an ion exchange which minimizes acid losses.  $H_2SO_4$  is used to regenerate more costly acids.

An example of the new fields of application that will now be opened up to magnesium is tooling plate. Previously, many of the plate sizes produced were too small for use without expensive welding.

Light weight and high strength of the metal, excellent machinability and low ratio of metal-to-machining cost are also making this tooling application attractive to many automobile producers. Specific applications include checking fixtures and gages, routing and drill jigs, table tops for assembly fixtures, stretch form blocks, bases for master plaster models and molds for fiberglass parts.

Other growing applications for flat rolled magnesium products include large tread plates (previously limited to 100 lb), aircraft accessories, farm machinery, Pullman and freight cars, buses, tracks and trailers.

## Centralize Atmosphere Generators to Improve Furnace Layout



By W. D. Latiano  
Metallurgical Editor

♦ Making best productive use of all available production area through better plant layout is a long range cost saver . . . Bingham-Herbrand recently took a step in this direction by centralizing atmosphere generators in a separate "gas house" to serve both forging and heat treating furnaces.

♦ Better control of atmosphere quality has been possible . . . This has paid off in more consistent results at the furnace . . . Now one man can operate all the generators . . . Two different atmospheres can be produced to meet varying demands of both forging and heat treating departments.

♦ **CENTRALIZING** the location of atmosphere generators pays off in better control of gas chemistry, higher rates of production with minimum manpower and higher quality of finished work. By placing the generators outside the production departments, valuable space is available for a more efficient plant layout of production equipment.

At the Aviation Div. of the Bingham Herbrand Corp., Fremont, Ohio, specialists in high-quality aircraft forgings, one 10,000 cfh and two 6000 cfh General Electric Neutralene generators are used in a gas-house setup. The company produces gas turbine buckets from S-816 cobalt alloy and other high temperature alloys. Compressor blades and other aircraft forgings are made from stainless and standard alloys.

Buckets and blades are forged and coined in 18 Maxipres forging presses. Heating is done in controlled atmosphere rotary hearth furnaces,

one of which is located at a convenient distance from each press. Forging and coining temperatures for the cobalt base buckets are 2050° to 2150°F; for the 403 stainless blades, 1900° to 2100°F.

After forging, buckets and blades are heat treated. Buckets are given a solution treatment of 2150°F and water-quenched from a rotary hearth furnace, then aged in a continuous-type roller hearth furnace for 12 hours at 1400°F. Compressor blades are hardened and drawn in a 2-furnace unit of the continuous roller hearth type. All furnaces are electrically heated and made by General Electric Co.

Because of production requirements, forging and heat-treating departments are in separate buildings. It was found unadvisable to locate the heat-treating department, with its many delicate precision instruments and comparatively light and sensitive finishing equipment.



ATMOSPHERE generators are located in their own department with all auxiliary equipment.

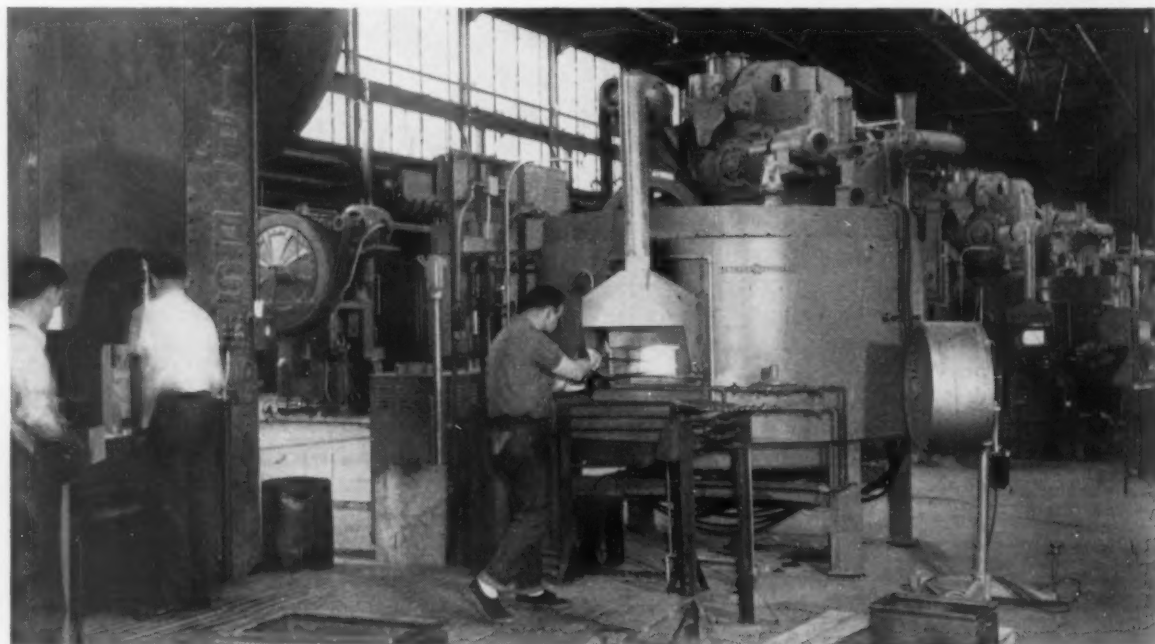
They can be hooked up to furnish varying quantities of two different atmospheres as required.

near the forging department. For best distribution of atmosphere the generators were located in a building between the two departments.

Generators are of the exothermic type: Air and gas are mixed to proper proportions with Selsa mixing equipment before entering the combustion chamber which operates at 1800° to 2100°F. Products of combustion are passed through heat exchangers and coolers to remove most of the water. Carbon dioxide is removed by passing the gas through scrubbing towers

containing a 12 to 15 pct solution of monoethanolamine (MEA) and water. The atmosphere here is approximately +35°F dew point. A small quantity of sulfur remaining in the gas is removed by passing the atmosphere over treated wood chips before the MEA solution.

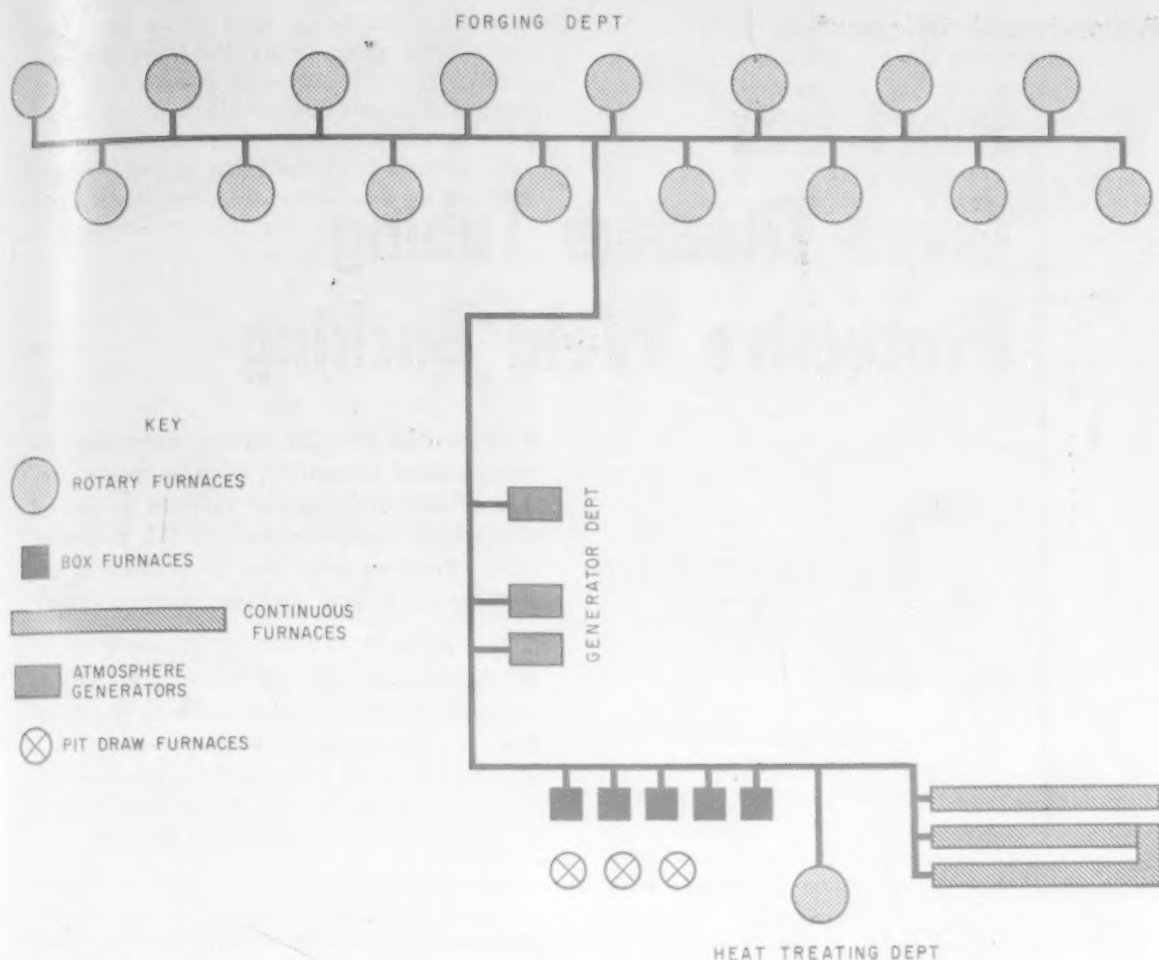
To lower the dew point further, the atmosphere is refrigerated and then passed through alumina dryers. Dew points of the atmosphere as it enters the delivery line can be maintained at -70°F. Each generator is a self-contained unit with its own cooling, scrubbing, refrigeration



FORGING furnace atmosphere is supplied through the floor. Work areas are free of equipment

not essential to production. The furnace is conveniently located to the press area.





**GREATER FREEDOM** in planning layout of both forging and heat treating departments at this

plant of Bingham-Herbrand was possible through centralization of gas generating equipment.

erating and drying equipment and, if necessary, atmospheres of different composition can be taken from each generator.

Each alumina dryer has two separate chambers. As one chamber is saturated it is periodically cut out and the drying elements are dehydrated automatically. During this cycle the other chamber takes over the burden of removing the moisture. The dew point of the atmosphere is recorded and controlled by a dew point controlling instrument.

Two general types of atmosphere are used by Bingham-Herbrand, one containing 5 pct combustible material is used in the heat treating of blades and buckets and one containing 20

pct combustibles is used in the forging furnaces. The 5 pct combustible atmosphere is also used with 1 pct natural gas added at the furnace for hardening 5 pct chrome dies used in the forging operation. One Bailey controller recorder monitors the combustibles content of the three generators. This is accomplished by automatically checking a sample of the atmosphere at the generator each hour.

#### Piping carried in tunnel

The drawing shows a general layout of the buildings and major equipment. Piping for the atmosphere to the forging furnaces is carried through a tunnel below floor level. By placing these pipes as well as all utilities in a tunnel, all overhead obstructions are eliminated and crane service to the forging equipment is unhampered. Piping to the heat-treating department is laid overhead since these furnaces are located near the walls and crane service is no problem.

The amount of atmosphere admitted to the forging furnaces is controlled at the furnace. Adjustment is made according to production requirements.

#### How Atmospheres Compare

Gas, Type	20 Pct Combustible	5 Pct Combustible
Air/gas ratio	7.5/1	9.6/1
CO	8.7	2.5
H <sub>2</sub>	10.0	2.5
CH <sub>4</sub>	0.03	Nil
CO <sub>2</sub>	Nil	Nil
O <sub>2</sub>	Nil	Nil

Prevents embrittlement—

# Inert Gas Gives Titanium Tubing Protective Weld Backing



By J. M. Thompson, Jr.  
Chief Metallurgist  
Consolidated Vultee  
Aircraft Corp.  
Fort Worth, Tex.

♦ Thin-walled titanium tubular assemblies are being welded successfully, using an inert gas inside of intricately shaped sections to prevent atmospheric contamination . . . This technique, which effectively overcomes the problem of embrittlement, is used for nonstructural aircraft parts.

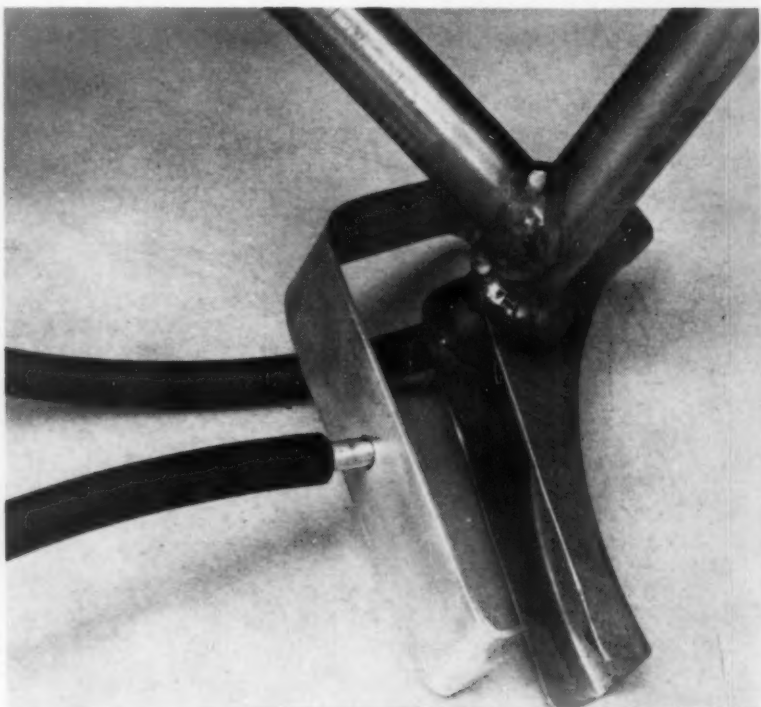
♦ Tubular assemblies are enclosed to provide maximum protection and to properly direct gas flow . . . The protective atmosphere, argon, is supplied for 30 sec before welding to purge contaminating gases, and for 30 sec after welding to prevent absorption of harmful elements.

♦ WELDING OF TITANIUM has been limited because the material becomes very active at high temperatures and absorbs oxygen, nitrogen and other harmful gases which cause severe embrittlement. This condition is particularly critical with thin-gage stock since these gases may penetrate the entire thickness of the metal.

Consolidated Vultee Aircraft Corp., Fort Worth, Texas, overcame this problem by protecting the inside of intricately shaped thin-wall tubular sections with an inert atmosphere.

The configuration of the tubular sections presented a difficult shielding problem. At first, it appeared that welding of all titanium parts

SIMPLE FIXTURE is fitted over titanium channel section to enclose it during welding. Flow of argon through assembly prevents contamination.



would have to be done in an inert gas-filled chamber to exclude harmful gases. From a production standpoint, this was not economically feasible. An alternate method was to flow argon through the enclosed tubular sections. This method proved so satisfactory that production welding has been authorized and is used for nonstructural aircraft parts.

Fusion welding of titanium must be controlled with the utmost accuracy. It varies in many respects from conventional techniques. Welders proficient in inert gas-shielded tungsten arc welding of stainless steel were selected to weld titanium because this process more closely meets the requirements for welding titanium.

All production welding is done with alternating current, using a virtually non-consumable electrode in the torch head. A 1/16-in. diam tungsten electrode has been satisfactory for all assemblies welded. Filler material is sheared to strips about 1/8 in. wide from scrap pieces of commercially pure titanium sheet. The argon used for shielding is a commercially pure grade.

Titanium parts must be degreased before welding to remove surface contamination. Parts exposed to heat in previous forming operations are chemically treated to remove any oxide film. If parts show evidence of a white or gray oxide coating acquired during hot forming, they are considered brittle and unsatisfactory for welding. All joints must be carefully fitted so that gaps do not exceed 0.30 in.

The blanket of inert atmosphere must be adequate to prevent absorption of harmful gases. This is particularly difficult with irregular or curved sections. Whenever possible, the heat-

affected zone on the opposite side of the weld should be enclosed to hold the inert atmosphere.

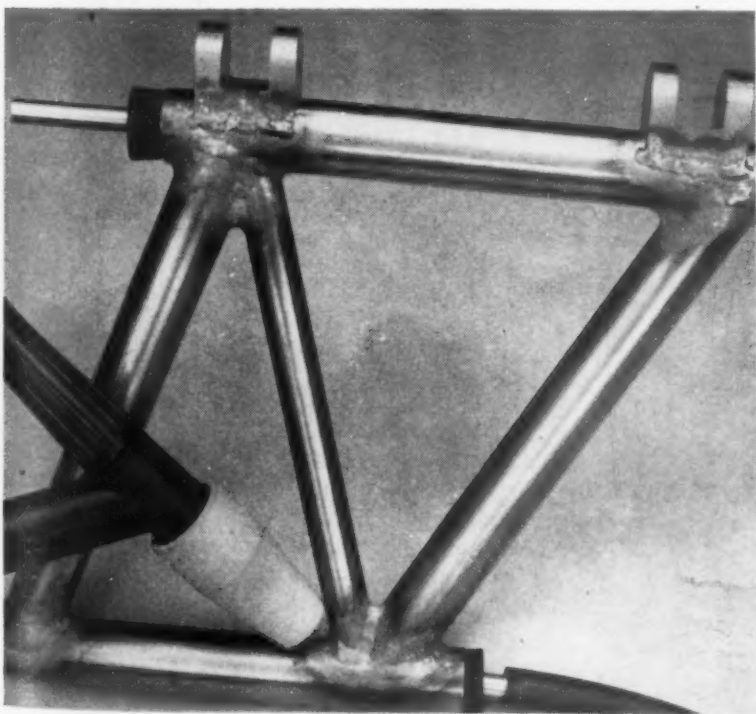
Tubular sections joined to other tubular sections presents another problem in atmosphere control. Whenever two tubes are joined, an interconnecting hole is necessary to insure adequate protection at the joint. The hole must be large enough to minimize turbulence in the flow of gas. In complicated sections, the flow of gas must be directed toward the area to be welded.

Control of the inert atmosphere is entirely up to the welder. The welder must start the flow of gas 30 sec before starting to weld. This purges the gas line and the area to be welded of contaminating gases.

The rate of welding is controlled so that the weld can solidify in an inert atmosphere and the heat-affected zone can cool sufficiently to prevent absorption of harmful gases. When a weld is completed, a protective blanket must be maintained for 30 sec to allow the metal to cool.

#### Photos put into record

The first acceptable welded assembly of a particular shape establishes the standard for subsequent assemblies of the same shape. The first assembly must be welded in accordance with standard procedures. Photographs of fixtures, gas shielding devices and other equipment are prepared for each assembly. Production parts are examined visually immediately after welding and before further processing can destroy evidence of improper welding or atmosphere control. This type of inspection forms the basis for final acceptance of parts, and for corrective measures, if necessary.



**INTRICATE** tubular shapes are stoppered to enclose inert gas. Flow of gas is directed to weld area for 30 sec before and after welding.



The combination counts—

# Choose Gear Inspection Methods to Meet Product Needs



By Fred Bohle

Manager, Machine Development  
Illinois Tool Works  
Chicago

♦ Lower costs in gear production, through better control of the production cycle, are possible where inspection methods are best suited to production process and use requirements. . . . Selection of most economical methods depends largely on method of manufacture, nature of production runs, and type of gear produced.

♦ Both gear rolling and analytical checking methods play important parts in gear inspection. . . . For both large and small producers the analytical comparator provides a valuable intermediate step. . . . Modern recording equipment helps spot the source of errors in gear manufacture.

♦ GEAR INSPECTION today means control over an increasingly complicated manufacturing cycle. Problem is to find the proper type and degree of inspection. Correctly applied, gear inspection reduces overall costs by: (1) Assuring a definite degree of uniformity in keeping with specific service requirements. (2) Permitting engineers to specify the most economical gear size and design. (3) Reducing scrap and rejections.

Both functional and analytical checking methods play an important part in gear inspection. Aim in production of any gears is a definite degree of uniformity consistent with service requirements. In varied instances gear inspection is essential to assure maximum load carrying capacity, minimum noise, maximum indexing accuracy, or any combination of these service requirements.

Dynamic loads imposed upon gear teeth as a



result of manufacturing errors can double rated tooth loading, even in a well proportioned gear. Most gears could be reduced in size if they could be produced more accurately.

In either shaping or hobbing, involute accuracy is predictable by the choice of the tool and the care in mounting and maintaining it. In hobbing the amount of involute error is determined by the hob. Hobs, in four classes are distinguished primarily by the amount of lead variation per revolution. This lead variation, possibly further aggravated by slight shape error, sharpening error and runout after mounting, is duplicated in the involutes of gear teeth. For a 10 diametral pitch gear, allowable "weave" of an "A" tolerance hob is 0.0005 in. Allowing for some additional error, involute errors in the gear will probably be limited to 0.001 in.

### Spacing vs. gear engagement

Involutes of shaper cutters are held to close tolerances. In the above case of a 10 diametral pitch gear, the tolerance would be 0.0002 in. Errors resulting from stress and deflections during cutting would put involute errors in the gear within 0.0005 in.

Spacing is equally important in determining smoothness of gear engagement. Spacing is a function of the machine in hobbing and of cutter and machine in shaping. Spacing is only controllable through the generating machines and because of wear, indexing accuracy of machines should be measured periodically.

If hobbing and shaping machines produce good spacing in a 36-tooth gear, they will probably produce good gears of other numbers of teeth. Therefore, an operator may cut a 36-tooth sample gear and have it inspected with index checking equipment. The sample gear blank must be well made because location at the time of hobbing must be duplicated in checking or errors occur for which the machines are not responsible. Since this check should be repeated from time to time, a 36-tooth index plate, Fig. 1, is a good investment in checking equipment.

### Plus, minus readings cancel

Another method of making this check is shown in Fig. 2. Reliability of such a space-comparison check, however, is limited by equipment sensitivity and operator skill.

Indexing errors in modern gear generating equipment show up only as small but persistent accumulations. It is argued the space comparison test cannot be used to arrive at the "accumulated error." Spacing error between adjacent gear teeth is from 0.0001 to 0.0005 in. But, slight misinterpretations of dial indicator readings in the plus and minus directions usually cancel each other out when quite a few teeth are checked.

Arriving at the accumulated spacing error, however, involves a bit of work. In a tooth comparison check on a 12 tooth gear the readings

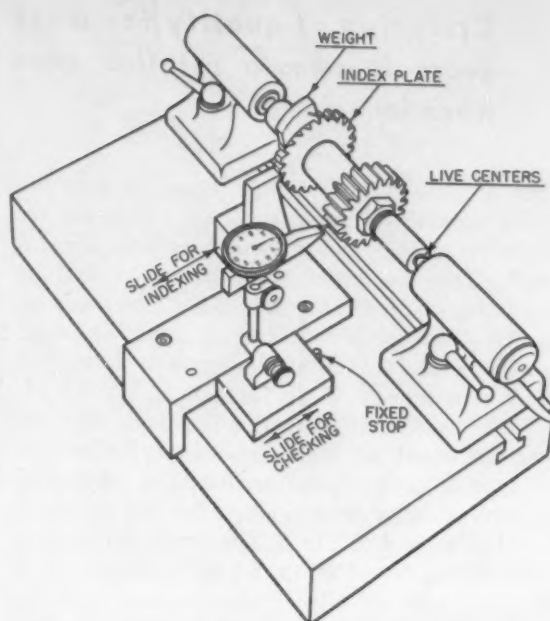


FIG. 1—Good investment for checking gears, a 36-tooth index plate is inspection time saver.



FIG. 2—Space comparison check for tooth spacing is limited by equipment sensitivity, skill.

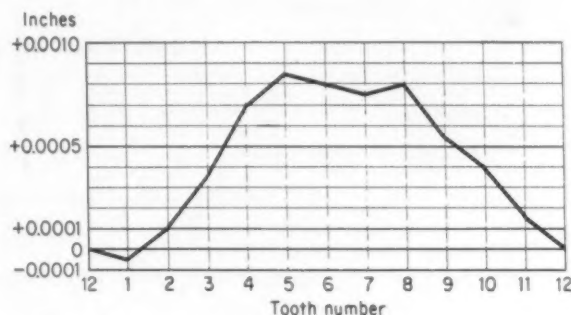


FIG. 3—Algebraic addition of spacing errors, C of Table I, shows overall range of errors.

Criterion of quality for most gears is smooth rotation even when idling . . .

in A of Table I were noted. Since the gear has a full number of teeth, spacings which are too large must be offset by others which are too small. The sum of all readings is  $\pm 0.0006$  in. indicating the indicator should not have been set to "zero" at the initial space. A correction of  $-0.00005$  in. for each reading and a revised check is necessary, B of Table I.

With this arithmetical correction, all plus spacings equal all minus spacings. From here the true or accumulated error of any tooth may be arrived at by progressive addition shown in C of Table I and in Fig. 3. The errors range from  $\pm 0.00085$  to  $-0.00005$  in. a total of  $0.0009$  in. If the gear were of 4 in. pitch diameter or 2 in. pitch radius, the total error at a 1 in. radius would be  $0.00045$  in. or 11 seconds over  $150^\circ$ .

Gear generating machines must also cut spur gears teeth parallel to their axis and cut a correct lead for helical gears. This function of the machines should also be inspected. Lead gages come with four leads. One is infinite and can be used for checking spur gears, Fig. 4.

Gears may be checked functionally, by the way they roll, or analytically by measuring dimensional characteristics such as involute, lead, or spacing. Criterion of quality for most gears is smooth rotation even when idling. Since that can only be achieved by relatively true running gears, with good involutes and spacings, it justifies checking the smoothness of rotation functionally.

Gear rolling fixtures, using master gears and indicators are often placed directly alongside the hobbing, shaping, and shaving machines to constantly check gears in production. They are also used at final inspection, sometimes combined with recording.

Functional gear checking gives a true measurement of size and runout. Beyond that, it gives an admittedly distorted, but nevertheless indicative, picture of individual tooth error. Gear rolling cannot reveal form errors on gears

TABLE III  
GROUND SPUR MASTER GEARS  
Tolerances, Coarse Pitch Series

Diametrical Pitch, in.		4 to 5.999	6 to 11.999	12 to 19.999
Active Involute Profile (Total Indicator Variation)		0.0003	0.0002	0.0002
Dimension over Pins	13° to 19° P.A.	$\pm 0.0014$	$\pm 0.0011$	$\pm 0.0007$
	Over 19° P.A.	$\pm 0.0010$	$\pm 0.0008$	$\pm 0.0005$

Pitch Diameter, in.		4.250 or Less	4.251 to 6.250	6.251 to 8.250
Runout, in. (T.I.R. at Approx. P.D.)	13° to 19° P.A.	0.0007	0.0008	0.0009
	Over 19° P.A.	0.0005	0.0006	0.0007
(Maximum Variation Spacing Between Adjacent Teeth)		0.0002	0.0002	0.0003

Lead or parallelism: Within 0.0001 in. per inch of face with minimum of 0.0001 in. Face runout (T.I.R.): 0.0001 in. per inch of diam. Hole size:  $\pm 0.0002$  in.,  $-0.0000$  in. Outside diameter:  $\pm 0.0010$  in.

heavily modified for deflection under load, nor will it serve to check the intentional lead variations (crowning) which compensate for mis-mounting. For these gears, gear rolling is used solely to measure size and runout and to detect nicks or burrs.

Basic gaging element in gear rolling is the master gear. Inaccuracies in a master gear contribute to indicator movement and leave a smaller tolerance for the production process. They also prevent duplication of results on successive checks.

Errors indicated in gear rolling are composite errors and, when recorded, are similar to Fig. 5.

TABLE I  
HOW SPACING ERRORS COMPARE

Tooth Number	1	2	3	4	5	6	7	8	9	10	11	12
A--TT Indicator Reading	0	0.0002	0.0003	0.0004	0.0002	0	0	0.0001	0.0002	0.0001	0.0002	0.0001
B--Corrected Indicator Reading	0.00005	0.00015	0.00025	0.00035	0.00015	0.00005	0.00005	0.00005	0.00025	0.00015	0.00025	0.00015
C--Algebraic Addition	0.00005	0.00010	0.00035	0.00070	0.00085	0.00080	0.00075	0.00080	0.00055	0.00040	0.00015	0



The individual tooth errors represent a composite of from two to four gear flanks in simultaneous contact. These individual tooth errors are arranged on a coarser wave pattern representing the runout or, more generally, the out-of-roundness of a gear. The "total composite error" usually looked for in gear rolling is a combination of runout and composite tooth to tooth errors.

Runout error is generally larger than individual tooth errors. If limits are assigned to the rolling check, they will be influenced by the decision on the permissible amount of runout. Standardized tolerances for total composite error are not yet available, however, the AGMA lists the values for runout shown in Table II.

### Valuable middle step

For both large and small producer, the analytical comparator provides a valuable intermediate step between gear rolling fixtures and intricate analytical machines. Except for very large or fine pitch gears, the master gear used for the rolling check could be made like the gear it is to check and used for a comparison of the involute, spacing and lead.

The machine combines all checks. Table motion parallel to the axis compares lead. Perpendicular motion checks involute or tooth profile and the in-and-out motion of the indicator slide checks spacing. This check, of course, is only as accurate as the master gear. Machine motion as such, other than the indicator and recording system, has no effect upon the results.

Table III gives tolerances commonly held on rolling masters. For closer tolerances special

TABLE II

### RUNOUT MEASURED ON PITCH CIRCLE

Class	Pitch Diam. In.	Dia- metral Pitch	Total Indicator Reading*								
			3/4	1 1/2	3	6	12	25	50	100	200
Class 1 (Up to 80 fpm)	1/2							100	100	140	180
	1						70	90	90	100	150
	2					60	80	80	80	90	120
	4				50	60	60	80	80	90	120
	8		30	30	50	60	60	80	80		
Class 2 (Up to 400 fpm)	16		30	30	50	60	80	80			
	1					30	35	40	45	60	
	2				20	20	25	30	35	45	
	4			20	20	20	25	30	35	40	
	8		15	15	20	20	25	30			
Class 3 (Up to 2000 fpm)	16		15	15	15	20	20	25	30		
	2				20	20	25	25	30	35	
	4			10	20	20	25	25	30	35	
	8		10	10	15	20	25	25	30	35	
	16		10	10	10	15	20	25	25		
Class 4 (Over 2000 fpm)	2				10	10	12	14	16		
	4				10	10	12	14	16	18	
	8			10	10	10	12	14	16	18	
	16		10	10	10	10	12	14	16		

\* All tolerances in ten thousandths of an inch. Until standard tolerances are available, runout figures, with a percentage added to reflect individual tooth errors, could be used as a guide.

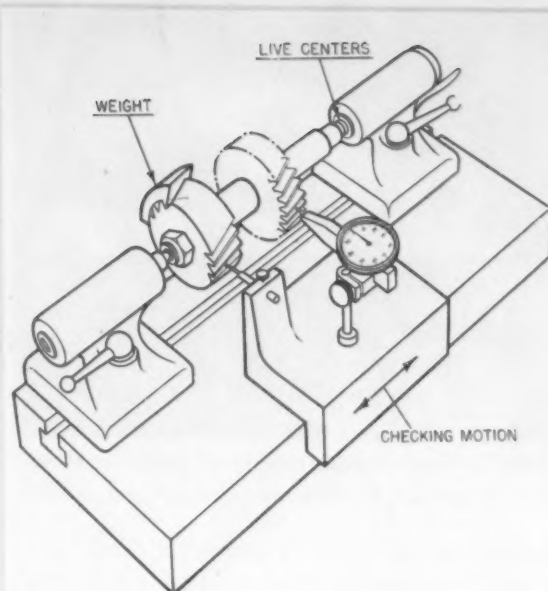


FIG. 4—Lead gage can be used to check lead of helical gear. Other leads check spur gears.

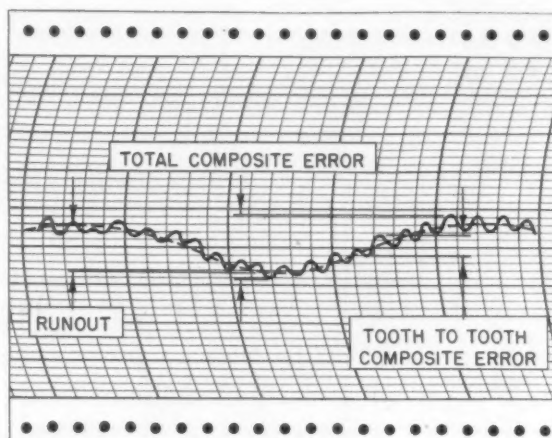


FIG. 5—Recordings developed from gear rolling equipment are used to spot source of errors.

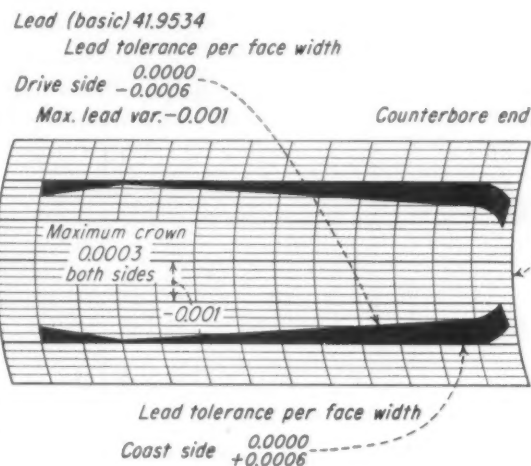


FIG. 6—Space tolerance area, etched on plastic, superimposed on graph, proved inspection aid.

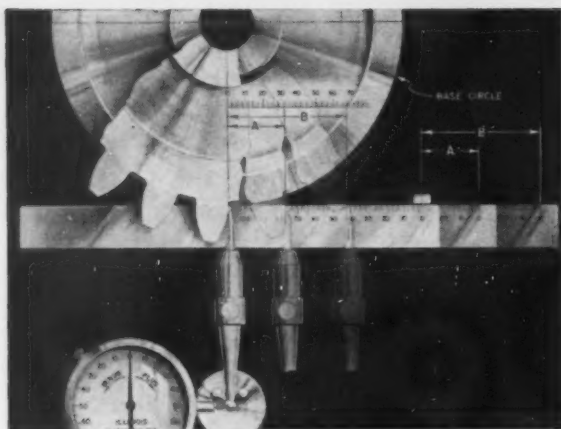


FIG. 7—Scale measurements of involutes show line of contact between two rolling gear teeth.

masters can be made for analytical check only. In that case, masters need not have a full complement of teeth. Grinding fewer teeth facilitates higher accuracy. The tooth to tooth check is replaced by a space comparison over two, three, or four teeth.

The analytical comparator is equipped with recording equipment. The recording chart reveals the true condition of the inspected surface much more indicatively than figures can. A recorded graph, by it's pattern will reveal the

cause of the errors. Indicator readings tell only the magnitude of these errors. Recording indicates where and what adjustments have to be made to improve accuracy. Recording also provides a permanent, easy-to-read record which minimizes error.

Some very close tolerance, fixed pattern gears cannot be inspected without the help of recording. Working tolerances, rather than being expressed in figures, are shown in an area. Such a tolerance area may be etched on a piece of clear plastic and superimposed upon the graph to see if the actual lead or the involutes are within the tolerance area, Fig. 6.

A similar pattern may be used for the involutes. Such patterns anticipate deflections under load, mismounting and deformations in heat-treatment. They usually follow the principle of "crowning" by placing the initial bearing at the best location. The maximum error is placed where it will do the least harm. While this system requires more control and inspection, it also permits the greatest possible tolerances with the least damage.

With the involute checking machine, the position of an error or intentional modification is given by the scale reading which shows how much the apron has moved from the starting point. Significance of the scale reading as re-

TABLE V

#### MAXIMUM VARIATION OF PITCH\*

Class	Dia-metral Pitch	Accumulated Error Between Any Two Teeth Exclusive of Runout Effect**									Pitch Variation Measured on Pitch Circle in Plane of Rotation**								
		3/4	1	3	6	12	25	50	100	200	3/4	1 1/2	3	6	12	25	50	100	200
Pitch Diameter, In.																			
Class 1 (Up to 80 fpm)	1/2															80	140	220	300
	1														50	75	125	180	250
	2														40	50	70	100	150
	4												30	40	50	60	90	120	150
	8										15	20	25	30	35	35			
Class 2 (Up to 400 fpm)	16										15	17	20	25	25				
	1														25	35	45	60	80
	2													10	15	20	25	30	50
	4												5	6	7	8	9	10	20
	8											5	5 1/2	6	6 1/2	7	7		
Class 3 (Up to 2000 fpm)	16										3 1/2	3 1/2	4	4	4 1/2	5	5 1/2		
	2					20	20	27	43	70				5	5	5 1/2	6	6	8
	4			15	15	15	21	33	53	75			3 1/2	3 1/2	4	4	5	5	7
	8		15	15	15	15	15	30	45	60		3 1/2	3 1/2	3 1/2	4	4	5	5	6
	16	15	15	15	15	15	15	24			2 1/2	2 1/2	3	3	3 1/2	3 1/2	4		
Class 4 (Over 2000 fpm)	2					10	10	12	20	30				4	5	5	5	5	
	4					10	10	12	20	30				3 1/2	4	4	4	4	4
	8			10	10	10	12	20	30	40			2 1/2	2 1/2	3	3	3	3	3
	16		10	10	10	10	12	20	30			2	2 1/2	2 1/2	2 1/2	3	3	3	

\* American Gear Mfrs. Assn.

\*\* All tolerances in ten-thousandths of an inch.

lated to the gear teeth is shown in Fig. 7. The scale readings are useful because the point of contact between two gear teeth rolling together proceeds along the line of action the same way the contact finger proceeds along the scale.

Equal scale increments represent equal time increments in the rolling of the gears, and profile charts of mating gears can be compared directly, Fig. 8. Accelerations or decelerations of the mating gears due to involute errors, occur at the same rate as the total errors do when plotted against the scale readings.

The scale reading is also important in its relation to base pitch, or the distance between teeth measured along the base circle. The total range of scale readings on the active profile must be somewhat greater than the base pitch to insure sufficient contact ratio. When intentional deviations are used, the scale readings show whether or not sufficient length of true involute is left on the teeth to insure their carrying the load from one tooth to the next. AGMA involute tolerances are shown in Table IV.

#### How lead errors affect rotation

Accuracy of straightness or lead is commonly related to tooth bearing and not to rotation. Some lead errors would affect the accuracy of the rotation in the way involute errors do, but the possibility is small and usually ignored.

Most space "measuring" machines are "comparators." They compare the spacing of the teeth and measure only the variations. The AGMA suggests the maximum variation of pitch shown in Table V.

Involute and space tolerances may be considered together because space variations with involute variations, determine the smoothness of engagement. Greater involute tolerances may be traded for tighter space tolerances, or vice versa. The space comparator is a versatile, hand operated machine. The indicator head can be adjusted to compare normal pitch of helical gears and base pitch of all gears.

Base pitch, the circular pitch at base diameter, is also the distance between successive driving involutes measured along a line running tangent to the base circle. All contact between two involute gears takes place on lines which run tangent to the base circle. Base pitch variations indicate smoothness of engagement because they are a combination of involute and spacing variations, Fig. 9.

To arrive at the accumulated error and its location on the gear a graphic method uses the measured variations directly. The inspector enters the figures in a graph consecutively adding or subtracting each space variation to or from the previous one. A line connecting the end point with the starting point represents all correct tooth positions. The out-of-position of all other teeth is then measured from this line. Maximum difference between any two points from this line is the accumulated error.

TABLE IV

#### INVOLUTE TOLERANCES Spur and Helical Gears

Class	Pitch Diam. In.	Dia- metral Pitch	Profile Error Exclusive of Tip Modification*								
			3/4	1	3	8	12	25	50	100	200
Class 1..... (Up to 80 fpm)	1/2							250	260	290	300
	1						50	60	70	80	90
	2					30	35	40	45	50	55
	4			25	30	35	40	40	40	40	45
	8		20	20	25	25	30	30			
Class 2..... (Up to 400 fpm)	16	15	15	15	20	20	25				
	1					30	35	40	40	45	
	2				20	20	25	30	30	35	
	4			10	10	11	12	12	12	14	
	8		9	9	9	9	9	10			
Class 3..... (Up to 2000 fpm)	16	7	7	7	7	7	7	8			
	2				11	11	11	11	11	11	
	4			8	8	8	8	8	8	8	
	8		8	8	8	8	8	8	8	8	
Class 4..... (Over 2000 fpm)	16	5	5	5	5	5	5	5			
	2				9	9	9	9	9	9	
	4				5	5	5	5	5	5	
	8		4	4	4	4	4	4	4	4	
	16		3	3	3	3	3	3	3	3	

\* All tolerances in ten-thousandths of an inch.

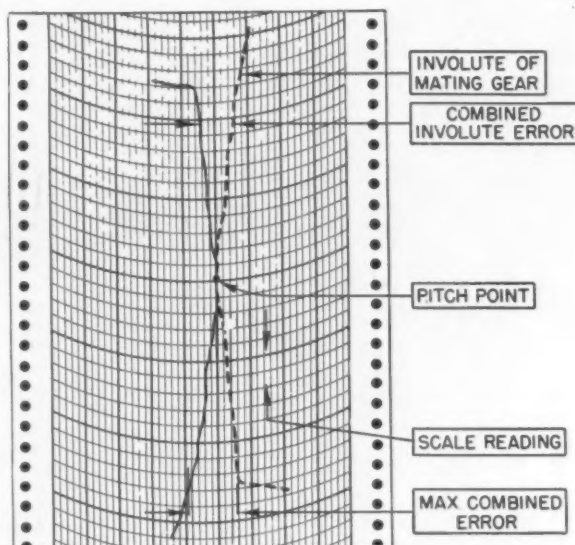


FIG. 8—Accelerations or decelerations of gears, due to involute errors, show in profile chart.

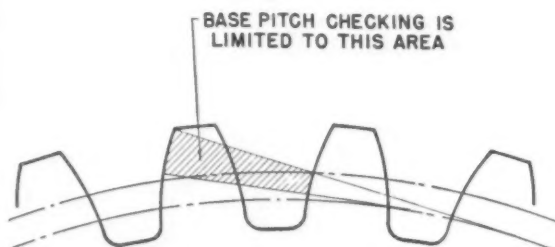


FIG. 9—Base pitch check can only be made over a limited area of active tooth surface.



Reduces scrap losses—

# Comic Film Helps Cut Careless Handling Practices



By Roy Coleman  
Manufacturing Manager  
Helicopter Division  
Bell Aircraft Corp.  
Fort Worth, Texas

♦ CARELESS MATERIAL HANDLING is feared like the plague in a precision metal-working plant. A nick or a scratch on a highly finished metal part may cost hundreds of dollars in lost time and material. In a new plant, staffed with new, unskilled employees, the disease can spread fast.

Loss through careless damage to critical

♦ The average American worker likes comic characters and new automobiles . . . He'll laugh at one; respect the cost of the other . . . Show him a "knucklehead" bungling around a plant damaging precision parts as expensive as a new car . . . The worker will laugh, but he'll get the point.

♦ This plant created such a comic, starred him making common, careless mistakes in a slide film series . . . Parts scrapped because of his mishandling were shown to cost as much as certain home appliances or other familiar items . . . Employees are cooperating fully . . . Damage from poor handling is dropping steadily.

parts was a serious problem when Bell Aircraft Corp. moved its Helicopter Division to Fort Worth, Texas. Twenty eight hundred plant workers recruited from the local labor market



HOW NOT to stack a trailer. Part which fell off may cost hundreds of dollars to repair.

never worked in a plant of this type before.

Helicopter transmission parts must be machined and tooled to an extremely high degree of accuracy. Actually, two transmissions will cost as much as three power plants. Yet, careless, inexperienced handling and a lack of proper packaging and boxing was resulting in serious damage to gears and other parts.

To complicate the issue, the Helicopter Division stepped immediately into a high-speed production program of a new tandem-rotor anti-submarine craft for the United States Navy. Time was at a premium.

The problem demanded immediate corrective action. The solution boiled down to a need for effective employee education. The next question: How does a comparatively small plant put over a vital lesson to 2800 manufacturing employees?

### Developed slide film

The company chose a two-way offensive, one based on a comprehensive training course for every manufacturing employee, the other on a week-to-week personalized "housecleaning" drive.

The program's unusualness lies in the method used by the training department to make a lasting impression in a limited time. To do the job, it picked on a trait common to the average American—his fondness for comic characters.

The training division developed an original slide film production, "Don't Be a Willie." Star of the film was a training department instructor who—for purposes of his role—became a slouchy, comical character named Willie Q. Knucklehead. His specialty was doing things wrong.

Company photographers made some 80 still photographs of Willie in action throughout the plant. Many of his production line mistakes were recognizable as poor materials handling practices actually going on every day.

### Classes are kept small

Interspersed between shots of Willie were facts and demonstrations of correct materials handling methods. Produced in full color, backed with a recorded sound track, including music, and wisely spiced with occasional jokes and pin-up pictures, the visual training production appealed to the average worker. It was not just another film, but one actually made in the plant among familiar surroundings.

One can walk through the production line most any day and hear Willie mentioned. Every time someone pulls a boner, he's called a "Willie" by his fellow workers. This proves that Willie saves hundreds of dollars every week.

For Bell, the film was literally a \$64 answer. Cost of mechanically producing the slide series amounted to roughly \$64 not including the photographer's time.



EVEN IF the box was OK, parts were already damaged from being jammed together.



IMPROPER stacking means parts may fall easily, damaging other expensive parts in box on floor.

Manufacturing employees view the film and are indoctrinated in preferred materials handling methods in classroom groups of 25 to 30. Time is important, but classes are kept small to promote a lively question and answer discussion after each showing of the slide series.

All employees attend the classes on company time, leaving their jobs for as long as an hour and a half.

During each class period, training instructors impress their listeners with the importance of keeping materials handling damages at a minimum. It is explained that helicopter manufacturing is a competitive business and the company must keep costs as low or lower than competitors. The employee is shown, in personal terms, how he is only insuring his own

## **A new department was set up to improve packaging procedures...**

job by conscientiously trying to cut costs.

One of the bugaboos of materials handling is, perhaps, the monotony of it. An employee with no particular insight as to what a part does and what it costs feels little personal obligation toward its proper care.

Realizing this, and also that workers are highly conscious of the cost of homes, automobiles, refrigerators, television sets, etc., training instructors decided to bring the two together. They have taken various helicopter parts and assemblies and compared their costs to the prices of such familiar items.

This has been an eye opener to the workers. When an employee realizes that a part he handles every day is actually as valuable as his new car, he becomes more interested in handling it with care.

Each classroom group sees an exhibit of parts damaged through careless handling and is shown what household appliance could have been bought for the money invested in each scrapped part.

In addition to this general course given all manufacturing employees, special courses have been prepared. Vehicle operators, assemblers, machinists, and others are shown that materials handling is not exclusively a function of the traffic department. Much damage is caused by employees in other departments who must handle parts.



**IDEAL WAY** to handle expensive parts is climax of educational filmstrip, "Don't Be a Willie."

While the lack of proper education of employees was responsible for most material damage, there were physical shortcomings as well. Employees frequently could not properly crate or box parts for moving because the proper boxes were not available.

A new Preservation and Packaging Department was established to set up specifications, procedures, and design special containers for shipping and handling parts.

General housekeeping throughout the plant also left much to be desired. Aisles became cluttered, trash was dropped in materials containers, and parts and tool chests were stacked precariously. In some cases, new racks and storage facilities were needed. But primarily, again, this problem called for making the employee conscious of his responsibility to himself, his fellow workers, and his employer to keep working conditions clean, orderly and safe.

### **Inspection team tours plant**

To solve it, the company inaugurated a simple program that has proven quite effective.

Each week an inspection team of two men from the industrial control and planning section and two invited foremen or assistant foremen makes a general inspection.

Arriving unannounced, the inspection team goes over each department, listing everything that is not in order. Copies of this report go immediately to department supervision so that corrective steps can be taken.

Signs, utilizing a humanized helicopter cartoon known as "Hoppy Copter," are posted in each department to identify it as clean or poorly-kept. The sign is left up for the entire week for all personnel to see.

Improvement was visible after the first housecleaning tour and has been steady since.

Management is certain that half of the co-operation stems from the policy of inviting lower echelon supervision on the inspection tours. The foreman or subforeman who goes along learns what to guard against in his own department. He comes to feel an increased measure of personal responsibility because he has served as an "expert" on the subject.

### **Drive stimulates interest**

There were those in the company who feared the campaign might result in grumbling among employees. But the opposite is true. Reports show that the drive is stimulating greater employee interest in all phases of plant operations.

Company officials anticipate, on the basis of results to date, that unnecessary damages will be cut at least 50 pct as a result of concentrated effort on proper handling. The plant is now a comparative model of tidiness where it once was cluttered. And production is proceeding on a smoother, more organized basis with less time lost through retooling or replacing damaged parts.

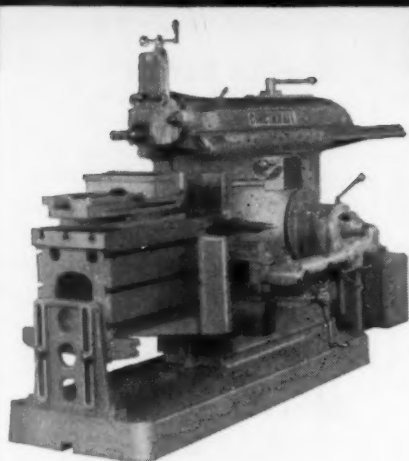


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*Photo courtesy of Marion  
Machine Foundry &  
Supply Company.*



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## FREE

New Bulletins

## Technical Literature

### Brick

Revision of 12-p. insulating brick bulletin has been made to include company's new 3000° F insulating refractory, H-W 30. Important feature of bulletin is 2-p. thermal data chart giving heat losses, heat storage capacities, and cold face temperatures for insulated walls built of various combinations of Harbison-Walker Refractories. *Harbison-Walker Refractories Co.*

For free copy circle No. 1 on postcard, p. 135.

### Surface grinder

Pratt & Whitney model D 14 in hydraulic vertical surface grinder is pictured and described in pamphlet. All controls are centralized in a single area right at the operator's hands. This assures maximum operator efficiency and eliminates unnecessary movement and minimizes fatigue. *Pratt & Whitney, Div. Niles-Bement-Pond Co.*

For free copy circle No. 2 on postcard, p. 135.

### Machine products

New brochure answers all questions about Precision Products Div. Major portion of company's business is with the aircraft engine builders and related industries. Illustrations of bolts, manifold couplings, valve rocker shafts, and push rod adaptors are included. Production facilities are pictured and described. *Precision Products Div., New Britain Machine Co.*

For free copy circle No. 3 on postcard, p. 135.

### Grinding

Booklet on modern trends in centerless and cylindrical grinding has been released by Precision Grinding Wheel Co., Inc. Both centerless and cylindrical wheels are made in Vitrified and Resinoid bonds, in all standard sizes, grades and structures. Additional literature gives facts and illustrations on wheels for carbide grinding and surface grinding. *Precision Grinding Wheel Co., Inc.*

For free copy circle No. 4 on postcard, p. 135.

### FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 135.

### Trucks

Magazine features new trucks recently announced by Lewis-Shepard. Many photographs of unusual applications of both hand and electric products are included with full descriptions. *Lewis-Shepard.*

For free copy circle No. 5 on postcard, p. 135.

### Screw machine

Double-matic utilizes a four-position tool holding turret revolving on an axis parallel to the spindle. Forming and cut-off tools are mounted on the front and rear cross slides. Cost saving features and specifications are listed in bulletin. *Porter-McLeod Machine Tool Co., Inc.*

For free copy circle No. 6 on postcard, p. 135.

### Boring heads

Catalog of off-set boring heads made in nine sizes has been issued by C. C. Craley Mfg. Co. Illustrations, prices, descriptions and specifications are included. All sets are furnished with standard shanks and equipment at above net prices. *C. C. Craley Mfg. Co.*

For free copy circle No. 7 on postcard, p. 135.

### Mill

Description of giant 30 by 36 in. breakdown mill used for brass cold rolling is given in brochure. Mill was designed along conventional lines although new features were built into it and minor changes were made after installation for improvement of operation and ease of maintenance. *Farrel-Birmingham Co., Inc.*

For free copy circle No. 8 on postcard, p. 135.

## Jacks

New jack manual helps you select the jacks best suited to your particular needs. Included are safety hints, how to care for jacks, definitions and other useful information. All jacks listed are standard and are divided into three types, ratchet, screw and hydraulic. *Duff-Norton Mfg. Co.*

For free copy circle No. 9 on postcard, p. 135.

## Tools

Catalog giving illustrations, prices, sizes and capacities of R and L tools which can be changed in 10 seconds for right or left hand turning has been issued by company. One item featured is the new recessing tool which can be adjusted to operate on any internal diameter within capacity of the machine. *R and L Tools.*

For free copy circle No. 10 on postcard, p. 135.

## Valve installations

Comprehensive instructions on the proper method of installing Line Blind Valves is contained in new 24-p. brochure. One section is devoted to trouble shooting for faulty-installation techniques along with recommended corrective procedures. *Hamer Oil Tool Co.*

For free copy circle No. 11 on postcard, p. 135.

## Locks

Wesson Co. has prepared a folder on new Dual-Wedg Lock giving complete specifications, applications and range of sizes available. The Dual-Wedg Lock is very new in design and offers many advantages in locking cutter blades, tool bits, etc., in cutter bodies, holders and broaches. *Wesson Co.*

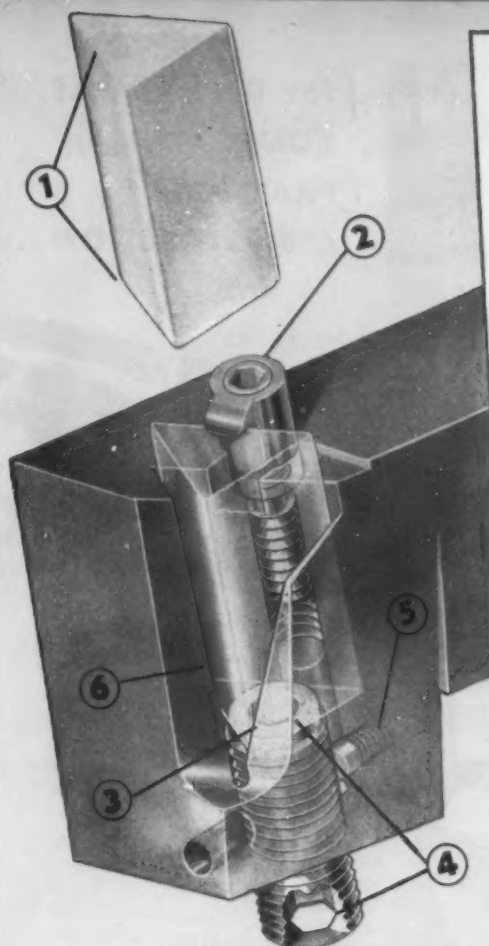
For free copy circle No. 12 on postcard, p. 135.

## Tracer-tool

Rotary stylus with positive wedge lock is designed to speed production and assure accuracy in high production duplicating work. Its purpose is to permit the cross feed screw to be set in one position and not moved while successive production pieces are machined. Illustrations are given in brochure. *Lehigh Foundries, Inc.*

For free copy circle No. 13 on postcard, p. 135.

Turn Page



## FEATURES of TOP-CLAMP KENNAMATICS\*

- ① Indexable Kennametal\* insert, pre-ground on both ends—provides six or more cutting edges (depending on style) before sharpening is required.
- ② Rugged clamp and screw is interchangeable on all standard Kennamatic styles and sizes.
- ③ Hollow back-up screw facilitates removal of snug-fitting (frozen) insert.
- ④ Hex sockets on both ends of back-up screw for quick adjustment or changing of insert, from either top or bottom.
- ⑤ Nylon plug, and spring, for friction locking of back-up screw.
- ⑥ Ample clearance at front of holder eliminates shank abrasion from "chip wash."

## ...For Getting Jobs Done **FAST!**

Kennamatic\* features help get the most out of a machine because there's far less downtime for tool changing when you put these multiple-edge, indexable insert tools to work. For example:

Conventional brazed carbide tools, used to rough turn SAE 1140 sleeve yokes, machined only 100 to 125 pieces per grind, and 1000 to 1250 per tool life.

Kennamatic tools were put on the job. Operating conditions and machining time remained the same, BUT—9 times as many pieces are now turned per tool grind, and 10½ times as many per tool life.

Tool cost is now only one-sixth of the former amount—and production is higher because of less downtime.

Kennamatic inserts have Kennametal's high hardness and wear-resistance for long life. Clamped-in, they can be indexed in seconds to new cutting positions without removing or resetting the tool... a great time-saving feature. After all cutting edges at both ends of an insert have been used, they are re-sharpened by squaring off the ends and grinding chip breaker, if desired—no precise angles to form; no steel to grind.

Only Kennametal makes Kennamatics. Ask your nearest Kennametal tool representative to help you apply this cost-saving tooling to your production or job lot operation. Kennametal Inc., Latrobe, Pa.

### HOW KENNAMATIC\* WORKS

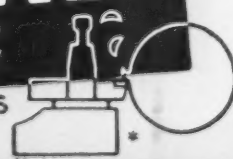
- 1 Kennamatic\* insert —round, square, triangular, or diamond shaped—is precision ground. It is placed in holder, adjusted to cutting position with back-up screw; locked into place by tightening clamp nut.
- 2 When one edge of insert becomes worn, clamp is released, and insert is turned to new cutting position. When all cutting edges of both ends have been used, the insert is easily reground.
- 3 Worn inserts are sharpened simply by facing off both ends. Back-up screw is adjusted (from either top or bottom) to bring cutting point to center.

\*Registered Trade-Marks

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▲ **Kover-Mor\* Goggles**—Large size, small weight, great comfort symbolize these molded nylon cup goggles. They provide ample room for comfortable wear over modern, heavy-frame prescription glasses. Rigid metal top bar insures easy handling. Adjustable head-band and screened leather bridge assure fit and comfort. Style CC70 with four screened ports and Super-Tough® lenses for chippers. Style CW70 with indirect ports, Willson-Weld® filter lens and Spatter-proof® cover glass for weldors.



▼ **CC60**—These Cover-All® cup goggles can be worn comfortably over normal size prescription glasses. Large perforated ventilation ports and ventilated external, metallic lens retaining rings reduce fogging to a minimum. Two-piece head-band and leather-curtained nose bridge are adjustable for wearer comfort.



▲ **Rubber Mask Goggles** are expressly designed to offer eye protection for workers in chemical process industries. Provide wide, undistorted vision and protection against acid splash and flying particles. Oil resistant rubber masks fit face perfectly and comfortably; may be worn over prescription spectacles. Style X41 has four screened and baffled ventilating ports. Style X44 is the same except it is not ventilated.

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## Free Technical Literature

Continued

### Paint sprays

*Nine Specialized Paint Booth Maintenance Products* is the title of new pamphlet being offered to paint booth operators. Pamphlet is broken into three sections, masking, deflocculating and stripping, and includes useful charts which indicate features offered by various paint booth maintenance products. *Turco Products, Inc.*

For free copy circle No. 14 on postcard, p. 132.

### Tungsten ores

Publication and availability of a revised brochure on the Beneficiation of Tungsten Ores has been announced. New brochure describes various methods of processing tungsten ores. *American Cyanamid Co.*

For free copy circle No. 15 on postcard, p. 133.

### Cut-off wheels

Bulletin on Manhattan cut-off wheels includes recommendations with wheel grade numbers for a wide variety of materials. Valuable operating suggestions for improved and faster metal cutting and photos showing the wheels installed on various types of machines are also included. *Raybestos-Manhattan, Inc.*

For free copy circle No. 16 on postcard, p. 133.

### Aluminum

*Research at ALCOA*, 54-p. booklet describes work of the Aluminum Research Laboratories and provides a useful bibliography of technical articles about aluminum. New publications will be of special interest to metal producers and users. *Aluminum Co. of America.*

For free copy circle No. 17 on postcard, p. 134.

### Openhearth

Detailed charts and cross-sectional drawings showing proved recommendations for high temperature insulation in openhearth furnaces are available in booklet form. Charted are the openhearth furnace checker chamber, fan tail arrangement and a sectional view of insulation required above the charging floor. *Illinois Clay Products Co.*

For free copy circle No. 18 on postcard, p. 134.

Turn Page

## WARNER & SWASEY REPORT FROM SENSATION MOWER, INC.



*Some of the many parts for power mowers turned out by two Warner & Swasey No. 3 Universal Turret Lathes at Sensation Mower, Inc.*

# "Even Better than You Said They Were!"

THIS STATEMENT came from Mr. W. H. Phelps, President of Sensation Mower, Inc., Ralston, Nebraska. His company bought two Warner & Swasey No. 3 Universal Turret Lathes in 1946 to machine parts for their power mowers.

Since that time these two versatile machines have efficiently handled all the growing metal turning requirements of the plant—more than 40 different parts for mowers, and more recently parts for their expanded line of snow removal equipment and

power floor polishers. And according to Mr. Phelps they have done the job faster than our own Field Engineer said they could. The company has even been able to take on sub-contract work on the side.

This is just another example of the extreme versatility of Warner & Swasey Turret Lathes—of their ability to produce many different parts with minimum setup time. And Warner & Swaseys will provide you dependable, high precision for years after they've paid for themselves!



YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

May 27, 1954

137

**METAL  
STAMPING  
FACILITIES**

by *Lansing*  
at your Service for...

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ESTABLISHED 1866  
**THE WHELAND  
COMPANY**  
CHATTANOOGA 2, TENN.

## Technical Briefs

Engineering

### Assembly:

**New approach to roller assembly problem cuts costs.**

A new approach to an assembly problem, in which spring pins are used instead of bolts for wheel axles, will save Wayne Iron Works, Wayne, Pa., close to \$4000 in manufacturing costs this year. The wheels are used in foot assemblies of the company's rolling gymstands.

#### Stands Roll to Wall

The gymstand which seats up to 276 persons per unit and folds up almost flat against a wall, rolls open or closed on 3-in. oilless plastic composition wheels. There are two wheels in tandem under each column of the structure. Supporting each row are two columns.

Until recently, Wayne Iron Works had used 5/16-in. bolts for wheel axles in the foot assembly. The bolt extended through one hole in the frame, through the center of the wheel and was threaded into a second hole—a tapped hole—in the frame. The end of the bolt was chipped off, then set with a center punch.

#### Improved Method Sought

The frame hole at the head side of the bolt had to be countersunk. The other frame hole had to be tapped. Once set, it was virtually impossible to remove the bolt to replace a wheel.

Looking for a less costly axle,



Old method was slow . . .

### IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 135. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

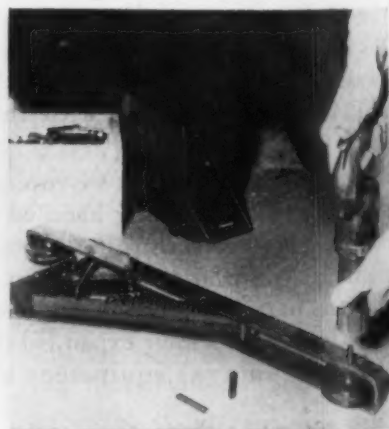
and one that could be easily removed, it was decided to try Sel-Lok spring pins made by Standard Pressed Steel Co., Jenkintown, Pa. These split tubes are force-fitted into drilled or punched holes of slightly smaller diameter. Each pin is held securely by its own spring action against the wall of the hole.

#### How Costs Are Cut

The spring pins cost less than bolts and also eliminate countersinking, tapping, chipping off the bolt end and setting the bolt.

A wheel can be replaced quickly by knocking out the spring-pin axle with a pin punch and reinserting it, in a second or two, with an ordinary hammer.

The rounded edges on the axial slot—feature of the spring pins—prevents reaming of the hole when the plastic wheel turns on the steel pin.



Pins are faster, cheaper . . .



No changes in manufacturing methods were needed in using spring pins. As before, the holes in the frame are multiple-punched in steel strap. After that the strap is bent in the form of a rectangle and welded. The tolerance of the punched holes,  $\pm .0015$  in., is sufficiently close to hold the pins securely.

#### Pins Contract

The axial slots in the pins are wide enough to allow several thousandths of an inch contraction when they are inserted.

The gymstands can be telescoped when not in use, thereby saving valuable floor space. For example, a 23-row stand with 22 in. depth per row requires only  $4\frac{1}{2}$  ft of storage space when closed. A 14-row stand requires only 2 ft 8 in.

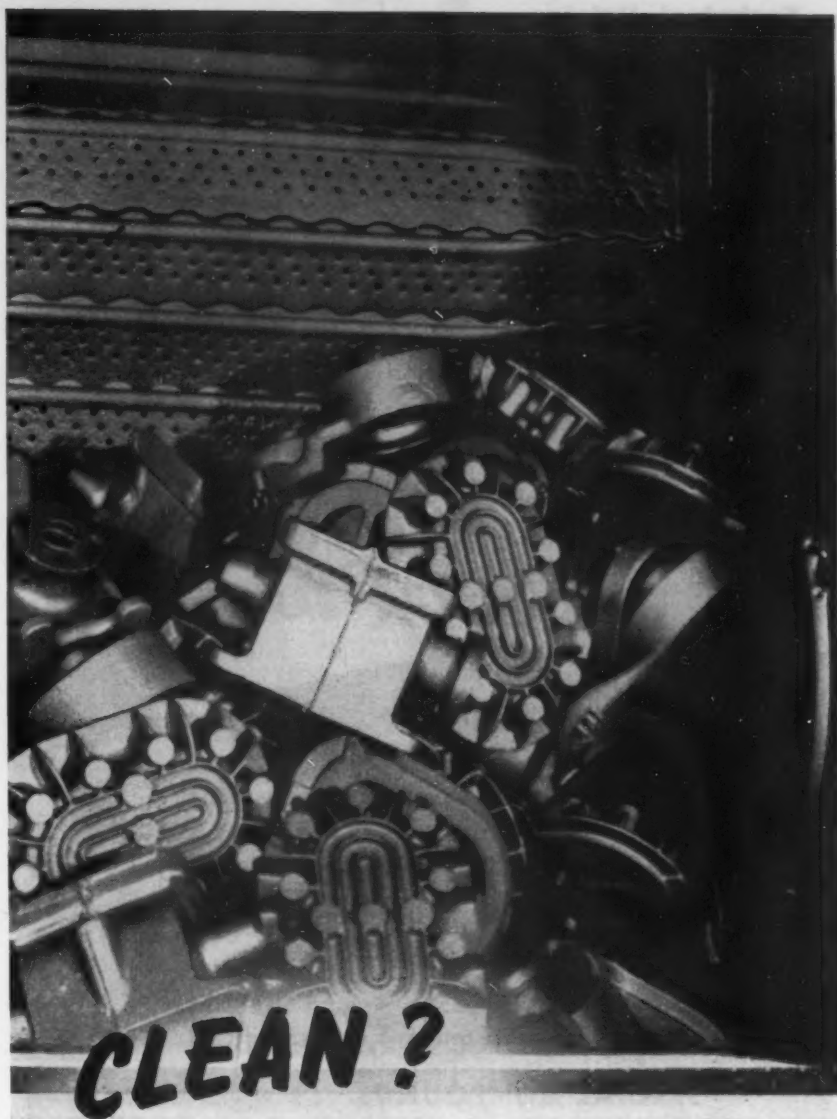
#### Each Row Rolls

The columns at the end of each row are held above floor level by a spring in the foot assembly when the stand is unoccupied. This allows each row to roll on its wheels. As a live load is applied, the spring stretches, allowing the column base to rest on the floor and take the live load off the wheels.

The pins for this application are plain carbon steel,  $\frac{1}{4}$ -in. nominal diameter,  $1\frac{11}{16}$  in. long. This type of pin has ample shear strength to withstand the weight of the gymstand.



Stands roll on assembly . . .



## You get castings like these when you use "CERTIFIED" ABRASIVES!

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sives can be reused . . . over and over and over again! So start cutting your cleaning costs today! Switch to "Certified" Abrasives made by the oldest abrasive manufacturing company in the world!

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STEEL SHOT AND GRIT CO., Boston, Mass.



## Foundry:

### Plaster process facilities expanded at several plants.

Improvement in the plaster casting process by Aluminum Co. of America has added an important

new production method to the Company's five foundries.

The plaster process, first developed on a large scale at Alcoa as a core material for the intricate bladed casting used in automotive torque converters, is now employed in a wide variety of aluminum foundry applications.



Whatever your particular steel cleaning job may be, there is a COWLES METAL CLEANER ready to handle it for you. The Cowles complete line includes all types of metal cleaners:

#### DETERGENT SILICATES

- DRYORTH\*, anhydrous sodium orthosilicate
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You will find a COWLES METAL CLEANER for every kind of soil, for steel of all types, and for most cleaning operations—soak tank, pressure spray, washing machine, emulsion degreasing, steam gun, electrolytic (anodic and cathodic). COWLES METAL CLEANERS are readily adaptable to varying water conditions and cover all alkaline pH ranges.

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Foundry facilities to use the new process have been expanded at the Company's Detroit and Cleveland Works where the new process was perfected, and new facilities have been completed at plants in Vernon, Calif., Buffalo, N. Y., and Bridgeport, Conn.

The plaster process has extended the design possibilities for aluminum and magnesium castings to allow production of parts in the foundry that were formerly impossible to produce. Plaster joins sand and iron (permanent mold) as a basic material.

#### Cuts Process Time

The use of plaster of paris for casting aluminum is nearly as old as aluminum itself. But heretofore its use has been limited by various factors including time and cost elements. Alcoa's new permeable plaster process reduced process time and cost, and thereby is opening many new fields of application.

Permeable plaster molds allow the casting of aluminum parts with thin cross sections and with excellent surface smoothness. In addition, accurate dimensional tolerances can be met with the process. The physical properties that can be achieved with permeable plaster are equal in most cases to those provided by aluminum sand castings.

#### See New Applications

Plaster mold components, already in extensive use for torque converter parts, offer other promising applications in the volume produc-



Used plaster process ...

## Technical Briefs

tion of small castings, such as small bearings and building hardware parts. The process is not limited, however, to small parts.

### Composite Mold Castings

Alcoa plaster mold components have been profitably used with sand or permanent mold materials to produce a composite mold casting. The plaster used in this combination allows the designer to specify surface and dimensional accuracy only where it is needed. Optimum use of the various mold materials will improve strength and often result in lower equipment and casting cost.

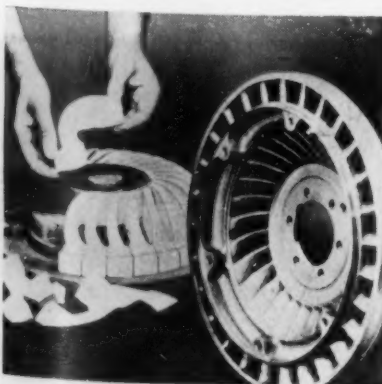
### Less Machining Required

While the plaster process will not match fine machining tolerances, it is sufficiently accurate to avoid the machining that is often required with sand or permanent mold.

General tolerances possible with this new process are 0.010 in. across the parting line for one inch or less. Between points pro-



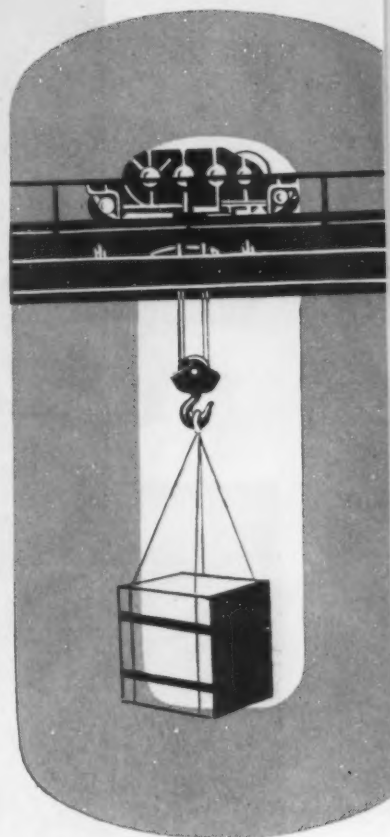
Pouring plaster cores . . .



Cores form blades . . .

Turn Page

# important LINK in AUTOMATION



A step toward automation is equipment for faster, less costly handling of heavy materials; cranes, custom designed for specific applications. Conco engineers can design such cranes — the right lift, the right speed, the right clearances. Thirty seven years experience are behind every Conco Crane recommendation. Request a Conco representative to call and discuss your problem. Or, write for Bulletin 3000A covering the complete Conco Crane line.



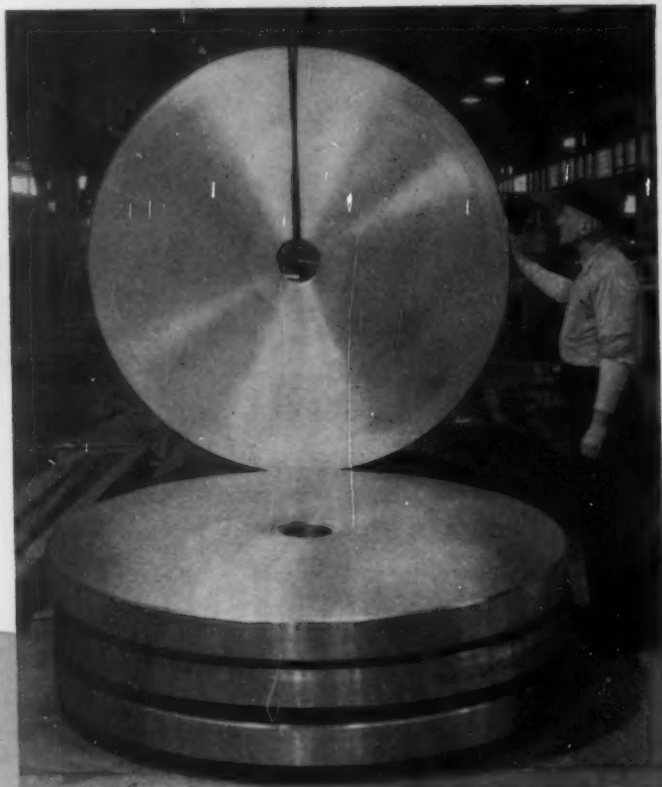
### CONCO ENGINEERING WORKS

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FOR THESE  
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BLANKS...

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**Unusual**  
IN PRODUCTION  
AT...

No matter how you look at it, these heavy gauge Blanks are unusual.

Unusual because they are made of Type 302 stainless steel. Unusual because they are 5" thick x  $7\frac{3}{4}$ " ID x  $78\frac{1}{2}$ " OD and weigh approximately 7000 pounds each. Unusual because each required special cutting and machining to produce its rough machined shape. But such jobs are not unusual at G. O. Carlson, Inc.

As specialists in working stainless steel, Carlson provides an unique service for you

...by having skilled workers produce your stainless shapes.

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Stainless Steels Exclusively  
Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

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District Sales Offices in Principal Cities

## Technical Briefs

duced in one part of the mold—0.005 in. tolerance is possible. A nominal surface finish of 125 RMS or better can be achieved. Sharp corners can be cast where it is necessary.

The development of the permeable plaster process will be extremely important to aircraft designers. At the same time, Alcoa expects the process to have an important impact wherever engineered metal parts are used.

## Tube Drawing:

**Tungsten-titanium carbide mandrels cut drawing costs.**

Big reductions in mandrel costs, plus elimination of almost all tube scrappage, are the benefits realized by a large metal working plant due to a switch from chrome-plated mandrels to those of tungsten-titanium carbide for cold drawing seamless steel tubing.

Their operation, performed at 75 fpm on a 150-hp cold-drawing bench, consists of reducing  $1\frac{1}{2}$ -in. diam by 0.083-in. wall SAE 1010 steel tubing to  $1\frac{5}{16}$ -in. diam with a 0.063-in. wall. Tube length when brought to the draw bench is 9 ft 8 in. After processing, length is 15 ft 9 in. Outside and inside diameters are held to tolerances of +0.001 to -0.005 in.

### Life Extended

Average draw life of chrome-plated and standard carbide mandrels was about 500 ft. Since



**Mandrel costs cut...**

## Technical Briefs

chrome mandrels cost about \$2 each, mandrel cost per foot of tubing produced was \$0.004, or 40¢ per hundred feet. By contrast, a Kennametal grade K-84 mandrel nib had drawn 440,435 ft, showing only 0.003-in. wear. Under this setup, mandrel cost is only about 1.1¢ per hundred feet.

### Savings Made

The same amount of production would have required 880 chrome mandrels at a cost of about \$1760. Since scrappage with chrome mandrels averages about 5 pct, a production of 440,435 ft would have resulted in 22,022 ft of scrap tubing. At 15.5¢ per ft, loss would have amounted to about \$3413.

To date, carbide nibs have provided savings of over \$5000. Additional production savings result from minimized machine downtime for mandrel changing. Equivalent results are obtained in similar operations using larger carbide mandrels.

The tungsten-titanium carbide mandrel resists pickup and galling. This is an important advantage where drawing operations must be exacting.

## Joining:

### New method nonfusion bonds steel to nonferrous metals.

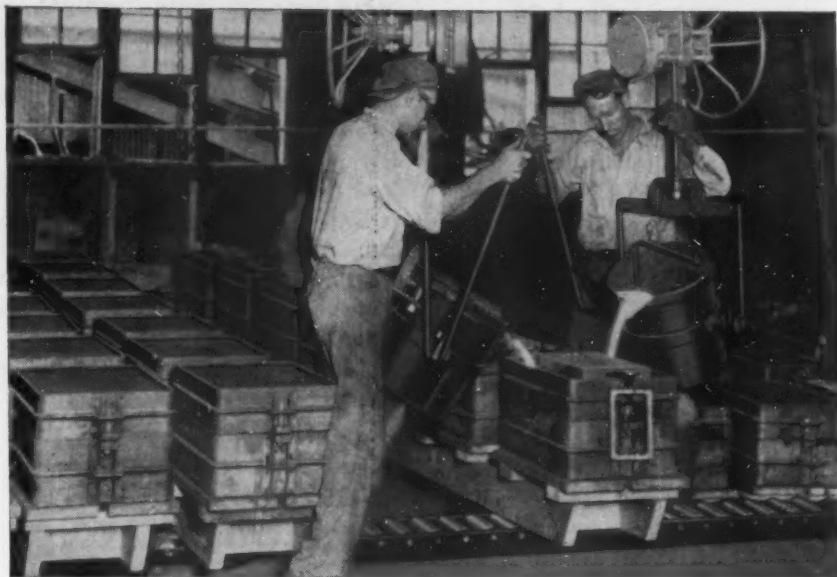
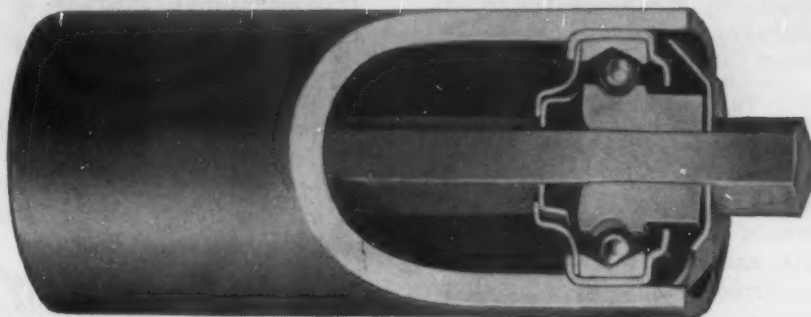
A recently patented process, called Weldbrazing, permits joining and building up both ferrous and nonferrous base metals with steel filler at working temperatures below those used for conventional fusion welding. This is done by creating on the base metal intermediary zones of lower melting and surface tension reducing elements of high fluidity before or with the deposition of molten steel filler.

The resultant alloy phases have a higher affinity to the base metal as well as steel filler which they bond at a temperature below the melting point of the base metal. By this method, iron, steel, cast

Turn Page

# STANDARD'S SHIELDED BEARINGS

## Are Expressly Designed for Foundry Conveyor Service



Every Standard roller conveyor is equipped with specially designed bearings that provide the maximum of protection and durability in foundry service. Spillage of hot iron is guarded against by special steel shields. These convex shaped shields fit into the ends of rollers to repel foreign matter. An exit for small particles is provided by an opening at bottom of shield.

Foundry conveyors are designed and built in their entirety by Standard—in a wide range of sizes, weights and types. You can depend on Standard for the right conveyor for your needs — we have been designing and building foundry conveyors since 1906.

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Send for Standard's special catalog "Conveyors for Foundries" — a valuable reference book illustrating and describing conveyor installations in leading foundries.

# Standard

GRAVITY & POWER  
CONVEYORS

ENGINEERED FOR LOW-COST PRODUCTION

May 27, 1954

iron, copper, brass, bronze, nickel and other metals and alloys can be joined or built up in similar or dissimilar combinations without actual fusion.

#### Tables Can Be Turned

In some cases, the roles of base metal and filler metal can be reversed, i.e., when the base metal is ferrous, the filler metal is nonferrous, and when the base metal is nonferrous, the filler metal is ferrous.

Bonding temperatures depend on the base metal used and the properties desired. Layers of desired physical and chemical characteristics can be obtained. Some properties claimed for the alloys developed are: Tensile strengths up to 130,000 psi, elongations up to 60 pct, hardness up to 76 Rc, good wear resistance, and good corrosion resistance against chemical, acids and acid mixtures.

Heat input is said to be 25 to 50 pct lower than for fusion welding.

## Computer:

### Instrument gives latitude and longitude of aircraft.

A computer set which gives latitude and longitude of aircraft in flight has been developed for the Air Force by Ford Instrument Co. Div. of The Sperry Corp., Long Island City, N. Y.

Positional change of an aircraft in flight is the result of factors such as airspeed, wind force, and wind direction initial preflight location of aircraft, and compass headings. These must be manipulated mathematically to describe the flight path.

#### Computes Position Rapidly

Rapid solution of flight path problems is accomplished by an analog type of computer which continuously displays the actual position of the aircraft in flight.

The computer operates on data

available only within the aircraft in flight, that is, without any contact with the ground. This rules out radar, radio and visual observation. The computer must be small enough to be not only airborne, but adaptable to many types of aircraft.

#### Has Four Components

The computer set is divided into four components. Controls have been simplified to the point where minimum time is required for operation.

The indicator unit displays the present position of the aircraft in latitude and longitude on easily readable counters. It also contains two slew switches to set the initial position of the aircraft into the system. This unit is designed for instrument panel mounting, wherever most easily seen by the pilot or navigator.

#### Figures These Variables

Variables such as values of wind direction and wind force, and magnetic variation of the area may be set into the system.

The computer unit receives input values from the other two units, and also airspeed from the aircraft airspeed computer, and magnetic heading from the aircraft compass system.

#### Has Amplifier Unit

Based on these inputs alone, the computer solves the navigation problem, and sends the answers back to the indicator where changes in position are added to the initial position.

This results in a continuous display of present aircraft position on the indicator unit.

The amplifier unit was designed to keep all electronic components separated from electromechanical parts. These components are all of the plug-in type grouped on the amplifier chassis. The amplifier contains its own power supply.

One specification was to design a computer that would operate at aircraft speeds of between 70 and 800 knots, and in winds up to 200 knots.



### A 3 Motor-double girder floor controlled EUCLID CRANE underslung from 3 roof girders

This crane is ideal for buildings wherein headroom is a factor and maximum lateral movement is desired.

It's a three-motor, floor-controlled crane suspended from three I-beams. Note that the bridge clears the side columns by mere inches.

This permits the trolley to travel unusually close to the walls affording maximum use of the floor area.

There is a Euclid Crane to handle all conventional and unusual operations—or we'll design one to do the job.



**THE EUCLID CRANE & HOIST CO.**

1361 CHARDON ROAD • EUCLID, OHIO



# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 135 or 136.

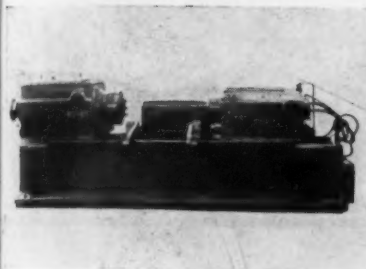


## Vitrified grinding wheel for foundry use

Known as the K Bond snagging wheel, this wheel gives up to 30 pct longer life with faster, freer cut. K Bond was designed for Crystolon silicon carbide wheels in rough grinding cast iron. Less dressing is required to keep it sharp, corners hold up longer without rounding, and the wheels can be consistently duplicated from wheel to

wheel and lot to lot. Operator fatigue is lessened. K Bond wheels can be made in all the sizes, shapes, grit sizes and grades (hardness) used on floor stand, bench stand, swing frame and portable grinders of the slow speed (6500 sfpm) type for snagging gray and hard malleable iron castings. *Norton Co.*

For more data circle No. 31 on postcard, p. 135.

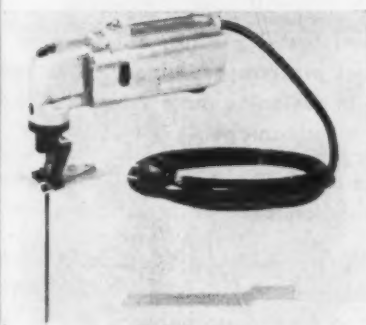


## Billet scalping machine turns magnesium billets

Magnesium billets 10 to 19 in. diam x 25 to 40 in. long can be turned on a new billet scalping machine. Equipped with a 200 hp motor, the machine is hydraulically operated, fully automatic, with loading device. A carriage, which can be equipped with 18 tools, is hydrau-

lically actuated and operated in an automatic cycle. Each cycle of the complete operation can be actuated individually. The machine is rated at 30 billets per hr, 19¼ in. diam, 40½ in. long turned down to 17½ in. diam. *Morey Machinery Co.*

For more data circle No. 32 on postcard, p. 135.



## Adapter converts nibbler to file or saw

A portable nibbler which utilizes a punch and die action to cut all metals up to 14 gage, including stainless steel, without distortion, can be quickly converted to a high speed production file or saw. A new two-piece nose piece cuts maintenance costs of the tool itself. Conversion is accomplished by attaching the easily-fastened adapter

to the nose piece and replacing the driving cam with another of longer stroke. The chuck accommodates either file or saw. As file or saw the tool can be used on any type metal or wood surface, curved or flat. As a nibbler, it will cut metal and follow a scribed line. *Fenway Machine Co.*

For more data circle No. 33 on postcard, p. 135.



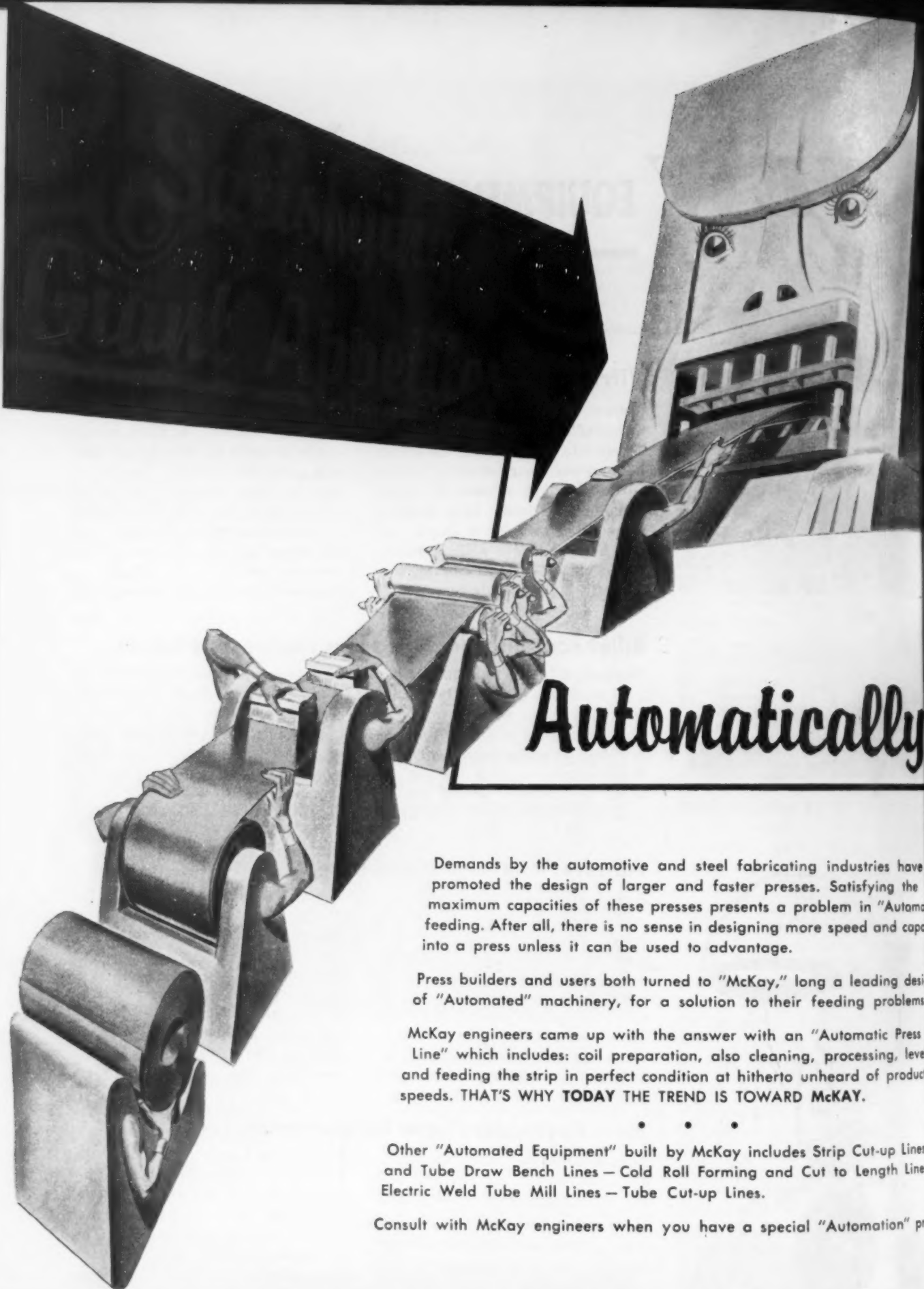
## New Payloaders have torque converters

Torque converter drive is standard equipment on the new HA and HAH front-end shovel loaders. And HAH is equipped with power steering. Struck-load and payload capacities for the pneumatic-tired, front-wheel-drive models are 16 cu ft payload, 12 cu ft struck-load for the HA model; 24 and 18 cu ft for

HAH. The torque converter is the 3-element, self-cooled type that automatically multiplies torque output of the engine in direct proportion to the load requirements. The converter acts as an oil cushion for the entire drive train. *Frank G. Hough Co.*

For more data circle No. 34 on postcard, p. 135.

Turn Page



## Automatically

Demands by the automotive and steel fabricating industries have promoted the design of larger and faster presses. Satisfying the maximum capacities of these presses presents a problem in "Automatic" feeding. After all, there is no sense in designing more speed and capacity into a press unless it can be used to advantage.

Press builders and users both turned to "McKay," long a leading designer of "Automated" machinery, for a solution to their feeding problems.

McKay engineers came up with the answer with an "Automatic Press Line" which includes: coil preparation, also cleaning, processing, leveling and feeding the strip in perfect condition at hitherto unheard of production speeds. THAT'S WHY TODAY THE TREND IS TOWARD MCKAY.

Other "Automated Equipment" built by McKay includes Strip Cut-up Lines, and Tube Draw Bench Lines — Cold Roll Forming and Cut to Length Lines, Electric Weld Tube Mill Lines — Tube Cut-up Lines.

Consult with McKay engineers when you have a special "Automation" problem.

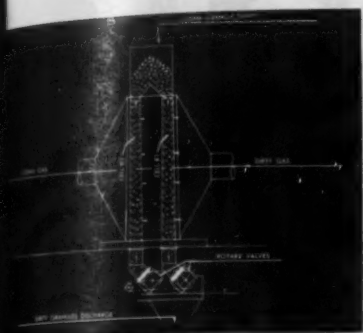
**The M<sup>c</sup>KAY MACHINE Company**  
YOUNGSTOWN, OHIO



ENGINEERS AND DESIGNERS OF  
EQUIPMENT FOR THE AUTOMOTIVE  
FABRICATING AND STEEL INDUSTRIES

## New Equipment

Continued

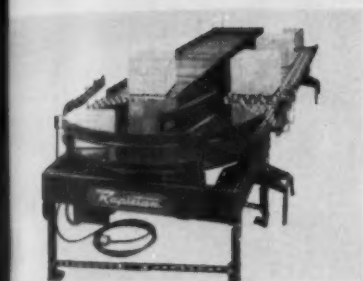


### Moving granule principle used for fume control

In the Dorfan impingo filter the control of fumes, dust and smoke is accomplished by a moving granule principle. Gases are passed horizontally through two or more cells containing moving granules. The granules are of various materials, depending on the type of filtering being done. As gases pass through the cells, solid matter strikes the

granules and adheres. Clean gases then pass through labyrinths in the granules to the exhaust system beyond the cells. These filters are recommended by the manufacturer for use in controlling fumes or smoke in electric steel furnaces, coke quenching operations, dryers, etc. *Mechanical Industries, Inc.*

For more data circle No. 35 on postcard, p. 135.



### Turntable transfers cartons between conveyors

With a new power turntable cartons can be transferred at 90° or 180° angles between two parallel or right-angle conveyor lines. The unit, which takes up only 4 ft floor space, has a rotating disc that floats packages around intersections where gravity or power con-

veyor curves cannot operate. Customer advantages are fast delivery and moderate cost. It handles cartons 22x18, 24x24, or 20x20 in. or too-small packages for other power curves. Wheel feeders position materials. *Rapids-Standard Co., Inc.*

For more data circle No. 36 on postcard, p. 135.

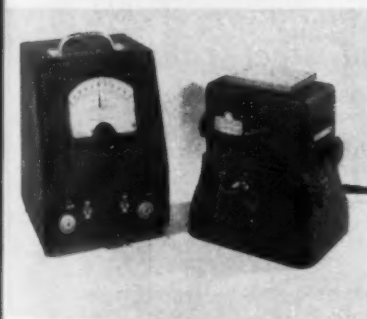


### Vacuum furnace for sintering carbide tools

Cemented carbide tools are sintered under vacuum in this furnace at Allegheny Ludlum's Carmet Div. The vacuum sintering furnace is designed to produce uniform temperatures up to 3500°F throughout the whole working zone 14 in. diam x 20 in. deep located in the center of the cylindrical steel vacuum chamber. The green tools are placed in this space for heating by induction coils supported by re-

fractory insulation which surrounds the working zone. Vacuum within the chamber, which is 48 in. diam x 54 in. high, inside, is drawn by a Microvac rotary mechanical vacuum pump with a pumping capacity of 500 cfm. Furnace is completely waterjacketed. Working temperature can be measured by an optical pyrometer. *F. J. Stokes Machine Co.*

For more data circle No. 37 on postcard, p. 135.

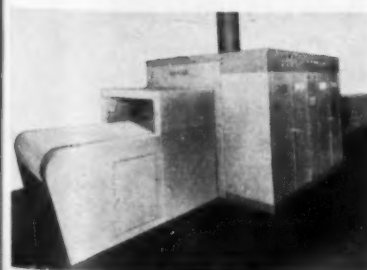


### Internal comparator measures small diameters

Internal diameters from 1/16 to 1/4 in. as well as roundness and taper can be checked on a new Electro-limit universal internal comparator. Designed for extreme accuracy, the Model D is a bench type instrument, furnished with a cabinet containing a DDU meter calibrated 0.001 in. full scale across its

4 1/2-in. dial, giving magnification of approximately 4500X. Gaging fingers are floating, and each finger is independently mounted on a gage head which feeds through two power units in the instrument cabinet to read on the single meter. *Pratt & Whitney.*

For more data circle No. 38 on postcard, p. 135.



### Dielectric core ovens feature unitized design

New line of Coleman dielectric core ovens comprise three basic models, with ratings at 15, 25, and 60 kw each. The ovens feature an integral, unitized design in which the oven conveyor, high frequency generator and control circuits combine to form a simple, rugged func-

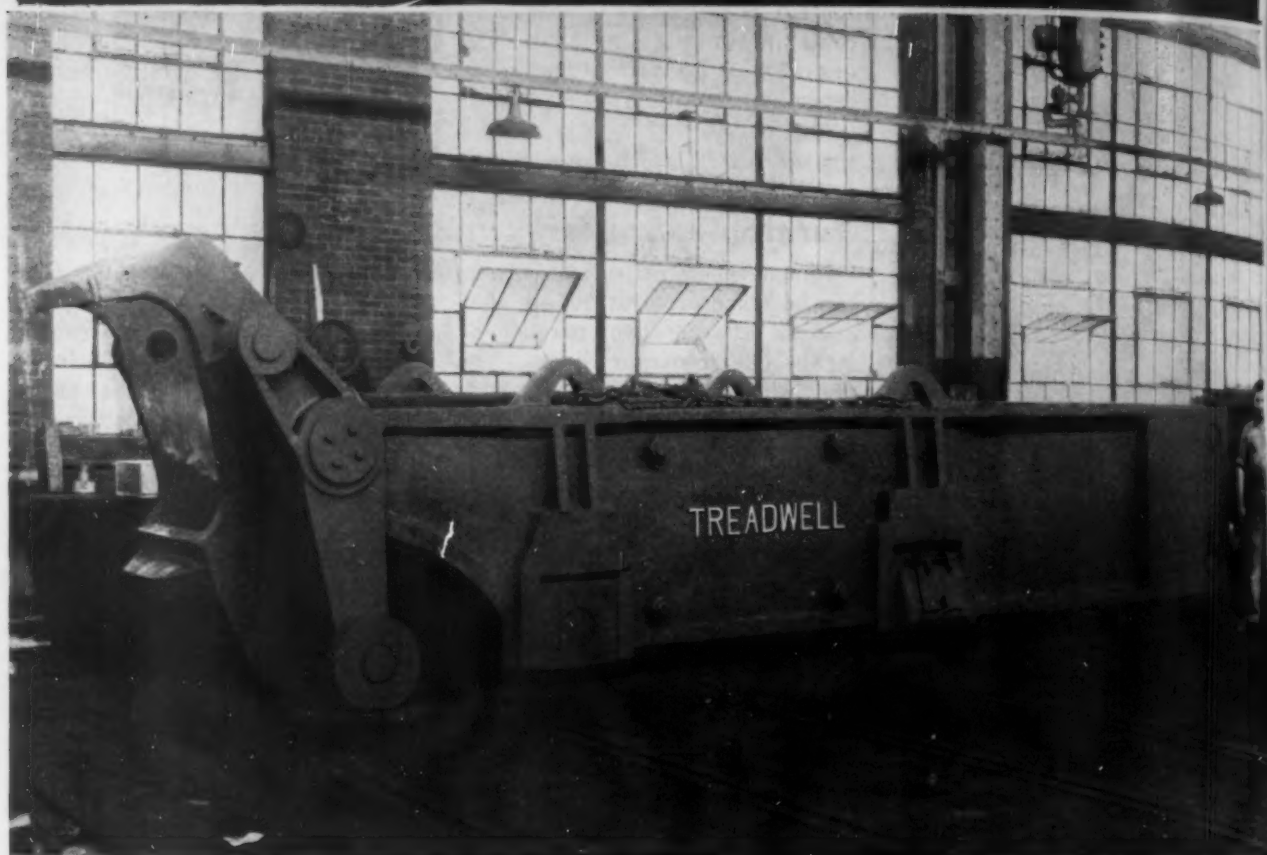
tional unit. Automatic load monitor and pushbutton spacing of the electrode free the operator from making frequent adjustments. Safeguards protect operators and equipment. *Foundry Equipment Co.*

For more data circle No. 39 on postcard, p. 135.

Turn Page



# Treadwell



## 30,000 lb. MOTOR DRIVEN INGOT TRANSFER CAR

*These cars are built to handle ingots up to and including 50,000 lbs., and will be built of either cast steel or welded steel construction.*

Manipulators, Mill, etc.  
Mills, Blooming & Billet  
Mills, Merchant & Bar  
Mills, Rod  
Mills, Sheet  
Mills, Strip (Cold)  
Mills, Strip (Hot) & Skelp  
Mills, Vertical Edging  
Tables, Mill

Tables, Tilting & Lift  
Tables, Transfer  
Transfers  
Coilers & Reels  
Conveyors, Coil  
Drives  
Ejectors, Furnace  
Gauges, Shear, Saw, etc.

Beds, Cooling  
Beds, Inspection  
Bumpers, Furnace  
Pushers, Furnaces  
Repeaters  
Handling Equipment (Kick-offs, Pilers  
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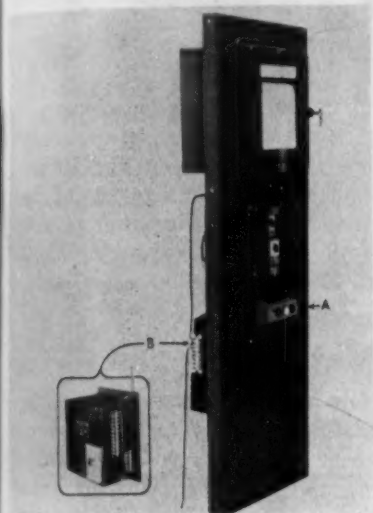
1015 FARMERS BANK BLDG.  
PITTSBURGH 22, PA.  
ATlantic 1-2883

## New Equipment

Continued

### Thermocouple repair

Poor, loose, or oxidized connections in thermocouple circuits, a common cause of error of pyrometer indication and control, can be checked with a new thermocouple circuit Restorer. The instrument quickly checks for faults and at the same time repairs them temporarily. The Restorer consists of a pushbutton station and a power-pack. By operating the button, a special pulse of electrical energy is



sent through the thermocouple circuit bridging the loose, corroded and defective joints. The reading then obtained is the true reading. A difference in reading before and after the use of the Restorer indicates a fault. Device is available for manual or automatic operation. It can be used on any kind of thermocouple wire. *Sherman Electric Co., Inc.*

For more data circle No. 40 on postcard, p. 135.

### 4-purpose electrode

Cham-Cut is designed for electric-arc cutting, chamfering, gouging and piercing. Flux-coated with a special alloy the electrode has a very fast cutting rate and is efficient for work on all types of steels including cast iron, and stainless, as well as copper and nickel alloys. Cham-Cut requires no special equipment. *Pacific Welding Alloys Co., Inc.*

For more data circle No. 41 on postcard, p. 135.

Turn Page

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A  
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Product

## Michigan Electric Resistance WELDED STEEL TUBING

### ROUND

$\frac{3}{8}$ " to 4" O. D. 8 to 22 gauge  
SQUARE-RECTANGULAR

$\frac{1}{2}$ " to 2" O. D. 20 gauge  
1" to 2 $\frac{3}{4}$ ", 14, 16, 18 gauge

Carbon 1010 to 1025

### Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

### Steering Jacket

Ready for the automobile assembly line is this vital volume produced tubular part of a major control unit.

Lower tube end is reduced to 2.260" O. D. x 10.525" long, held to close tolerance for assembly in line with body of base tube without machining. Upper end is reduced to 2.125" O. D. x 2.562" long, held on center line to extremely close decimal dimensions, with two perforations at tapered section. Michigan workmanship can always be depended upon to assure the exacting tolerances and part uniformity to keep customer assembly operations moving smoothly.

Michigan engineers will be pleased to work with you on an adaptation of welded steel tubing to help you make your product better at lower cost.



Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested **ONLY IN THE FABRICATION OF** Stainless steel, copper, brass and aluminum tubing.

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TELEPHONE: WOONSOCKET 1.

## New Equipment

*Continued*

### Multi-service wrench

New speed action combination pipe and nut wrench automatically grips and releases on pipes and nuts, securing an instant, fractional ratchet action grip that cannot slip. Self-adjusting trigger mechanism permits one-hand operation.



Wrenches are made in alloy steel and alloy aluminum and as non-sparking tools, in a variety of sizes with replaceable insert jaws. Trig-O-Matic Tool Corp.

For more data circle No. 42 on postcard, p. 115.

### Metal spray unit

New metal spray unit applies hardfacing coatings in powder form. The Spraywelder is adapted to application of Colmonoy nickel-base wear and corrosion-resistant



hardfacing alloys to steel, stainless steel and some cast iron and copper alloy parts. The powdered alloys are applied by spraying and then fusion-bonded to the part by heating with an oxyacetylene flame. Wall Colmonoy Corp.

For more data circle No. 43 on postcard, p. 115.

**Turn Page**







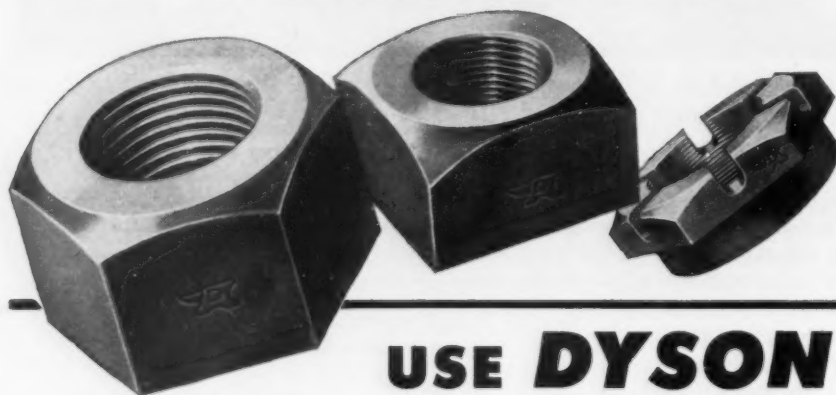
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## New Equipment

Continued

### Industrial test kit

Simple Teskit for controlling metal cleaning solutions can be accurately operated by untrained personnel. By varying the testing solutions, the one basic Teskit is adaptable to all industrial products in the

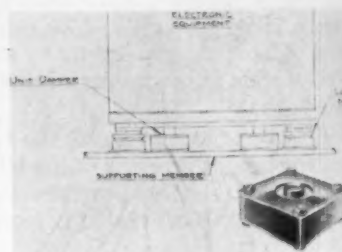


Wyandotte line, except emulsion cleaners. Each kit contains sufficient testing solution for approximately 180 tests. Only a few drops of testing solution are necessary to secure accurate readings. Wyandotte Chemicals Corp.

For more data circle No. 44 on postcard, p. 135.

### Unit damper

New vibration damper provides additional damping required in many vibration control systems. Amount of damping is varied to fit the particular characteristics of the suspension system. Application of the unit damper reduces amplitude at



resonance, resulting in lower forces being transmitted to the mounted equipment. The unit damper provides damping in any direction. Components have unique arrangement; materials and design have been chosen for their ability to meet specific requirements. Lord Mfg. Co.

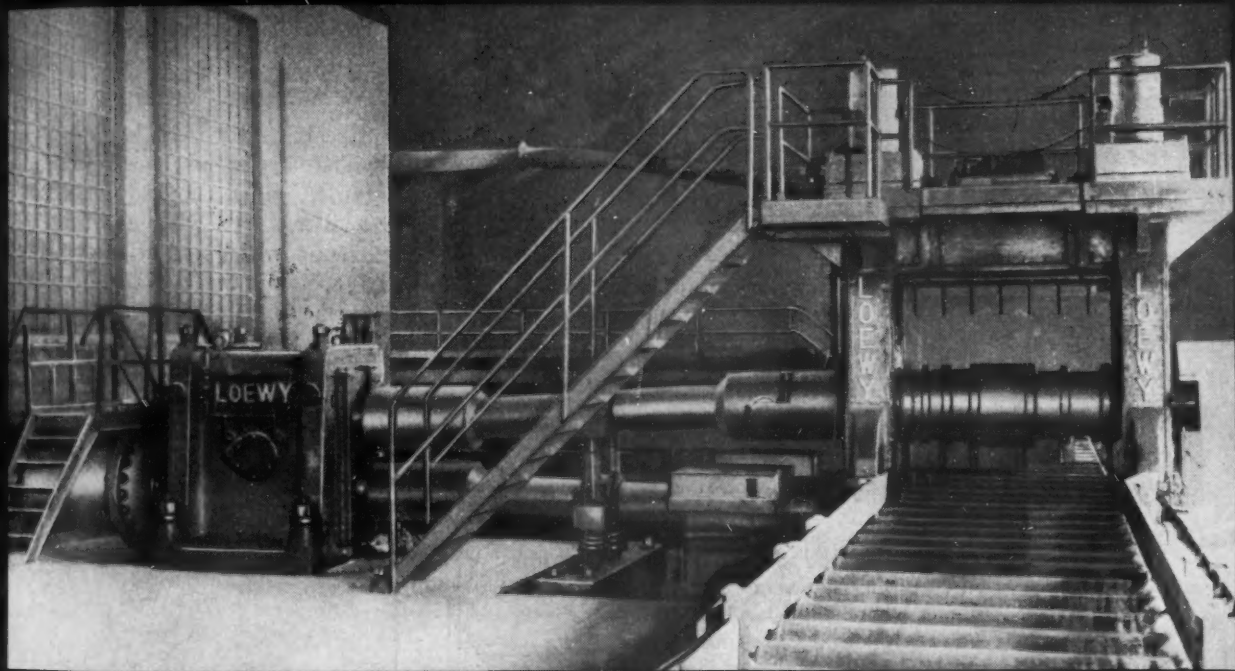
For more data circle No. 45 on postcard, p. 135.

Turn Page

# WE BUILD COMPLETE ROLLING MILL INSTALLATIONS



14" Three-high Blooming Mill Stand, part of a complete Blooming, Slabbing, Structural, Wire Rod and Strip Mill.



26" Two-high Blooming Mill, part of a complete Blooming, Slabbing, Structural and Strip Mill Installation.

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May 27, 1954

153



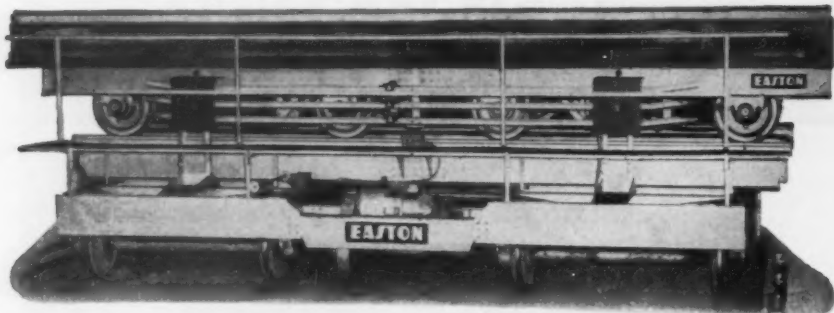
# EASTON



**EASTON** experience covers small and large capacity furnace cars for every requirement.

## Furnace Cars

Electric furnace car mounted on electric transfer car for completely automatic continuous heat treating system.



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### HISTORY OF WELDING

The Delhi Column, built over 2000 years ago by fire welding thousands of small pieces of iron together. This Column still stands before the Great Gate in Delhi, India... a silent tribute to the early craftsmen.

Weldit's method of experimental research... both in the laboratory and on the production line results in new features being added to design and manufacturing processes which ultimately in Weldit Torches and equipment.

### THE WELDIT GASAVER



The Weldit Gasaver is the original unit for reducing oxygen and acetylene consumption costs. Also cuts fire hazards and lowers operators fatigue.

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DETROIT 38, MICHIGAN**

## New Equipment

Continued

### Low-cost cleaner

New 5-hp portable vacuum cleaner is designed to operate two 50-ft 1½-in. hoses simultaneously, or one 75-ft length of 1½-in. hose. Hoffco-Vac 35 has a large dust



bucket and is equipped with an exhaustor and motor which produce 6.5 in. hg suction. The cleaner turns easily within its own length. *U. S. Hoffman Machinery Corp.*

For more data circle No. 46 on postcard, p. 135.

### Wire handling

Streamlined wire handling is provided by a new packaging container, called the Payoffpak. It is a fiber drum with a center core, around which the wire is packed; a special "hat" attachment, that fits over the core and acts as a guide for dispensing the wire; and a metal lid that is secured by a lever-lock metal band. Its principle, which is simplicity itself, offers short-cuts and economies to both the wire manufacturer and fabricator. *Continental Can Co.*

For more data circle No. 47 on postcard, p. 135.

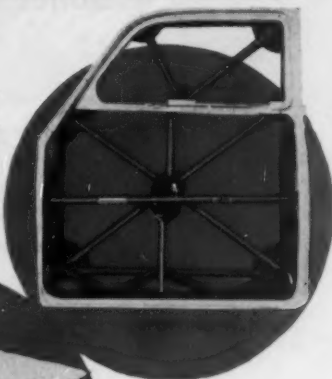


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Just 1 hand operates  
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No knurls to  
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With the **ONLY** Instant, Speed-Action "Fractional," Ratchet-Action, Non-Slip Grip that insures safety! TRIG-O-MATIC'S "automatic eye" adjustment control assures positive, easy, non-slip 1-Hand operation...It automatically grips and releases on pipes, nuts, and fittings.

Here's the first real development in wrench history. An amazing wrench that's made for efficient 1-Hand operation—eliminating clumsy 2-Hand fumbling. Exclusive, self-adjusting Trigger adjustment requires only one hand on the handle to set and release jaws. A Time-Saver! Ideal for work in cramped quarters!

**LONG ECONOMICAL SERVICE** assured. Made of forged alloy steel—exactly machined—excellently and attractively finished. The Induction-heat treated JAWS are easily RE-PLACABLE whenever present ones become worn...thus, assuring longer, more economical use. Each wrench is "Envelope-packed" for protection and convenience.

- 1 hand on handle sets and releases jaw grip—no knurls to fumble with.
- Bull-dog teeth that "bite-in" and HOLD!
- Will not strip off galvanized pipe.
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15" opens 3/4" to 2 1/4"

Larger sizes will be available

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This is an introductory item of TRIG-O-MATIC's line of distinctively different, economical Industrial Hand Tools which will be exhibited at THE NATIONAL HARDWARE SHOW Oct. 11-13 Navy Pier, Chicago BOOTH NO. 523 — North Hall



BETTER PERFORMANCE  
thru BETTER DESIGN

ON YOUR  
**RUTHMAN  
GUSHER**  
COOLANT  
PUMPS



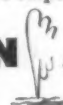
Illustrated is an Abbey Etna Swaging Machine, Series #154, equipped with a Ruthman Gusher Coolant Pump

All Gusher Coolant Pumps are designed to give you better performance. You get split-second control of coolant flow from the instant the machine is turned on.

Pre-lubricated heavy-duty ball bearings require no further lubrication. There is no packing or priming necessary. The electronically balanced rotating assembly reduces vibration and lengthens the life of your Gusher Coolant Pump. Always specify Gusher Coolant Pumps. Write for catalog.

THE **RUTHMAN** MACHINERY CO.

1809-1823 READING ROAD



CINCINNATI 2, OHIO

May 27, 1954

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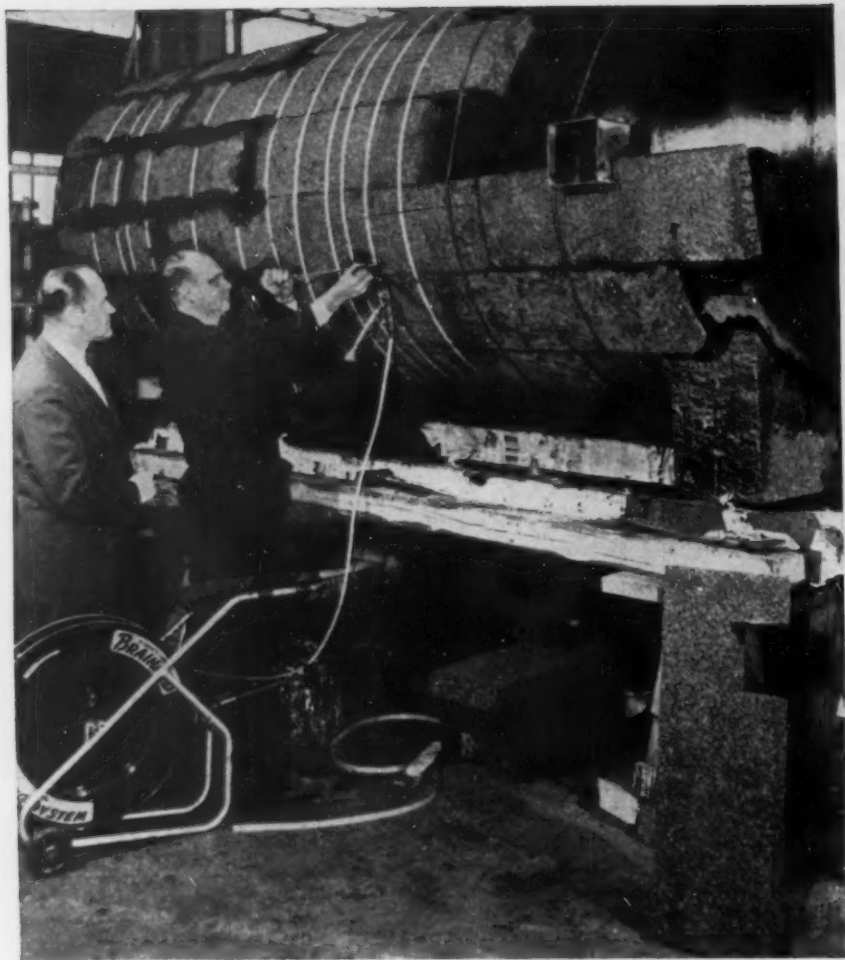


Photo courtesy Liquid Carbonic Corporation

## BRAINARD STRAPPING SERVICE

### Wraps up an insulation problem

• Here's a vital step in Brainard service—showing how it's done.

Sydney White, one of Brainard's Chicago salesmen, was called in to help work out a better method of securing insulation on these liquefied gas containers. After analyzing the problem, he recommended Brainard galvanized strapping—to resist moisture from condensation. He demonstrated special tools—that permit strapping tightly on a curved surface. Result—a satisfactory solution that saves labor and materials in the bargain.

Call your nearby Brainard salesman for this kind of service on your packaging and materials-handling. Brainard offices located throughout the U. S. and in Canada. For booklet on Brainard Strapping System write Brainard Steel Division, Dept. O-5, Griswold Street, Warren, Ohio.



For booklet on Brainard Strapping System write Brainard Steel Division, Dept. O-5, Griswold St., Warren, Ohio.

## STEEL STRAPPING

## New Equipment

Continued

### Boiler cleaning

New line of colloidal formulas when added to boiler water of various types, dissolves all forms of scale and corrosion, oil and grease and hold resulting solid particles in suspension for removal by blow down. Mud and sludge are carried off by this method rather than deposited. Normal boiler operation is not disturbed. Most boilers can be cleaned thoroughly, it is stated, in from 30 to 40 days almost regardless of conditions. *Water Treatment of America.*

For more data circle No. 48 on postcard, p. 135.

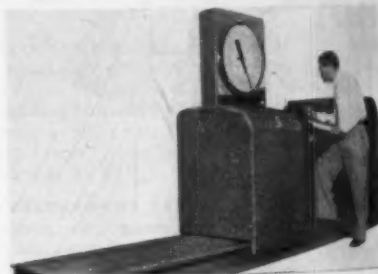
### Chromate reducer

A new product called Chromekill 4A for destruction of hexavalent chromium in alkaline cleaning and plating solutions was designed to give a dual action. It contains materials for fast reduction of hexavalent chromium to the harmless trivalent chromium state, and it also contains more stable reducing agents to give prolonged protection. The material is a fine free-flowing powdered mixture and is used in concentrations of 1/4 oz per gal. *Enthone, Inc.*

For more data circle No. 49 on postcard, p. 135.

### Torsion testing

Machines for twist-testing components, assemblies, sample stock and wire can apply and weigh load in either direction of rotation. Indicating unit follows dimensional



changes of specimen as load is applied; no additional forces are set up during test. Five scale ranges assure precise load reading. Capacities range from 4000 to 300,000 in-lb. *Riehle Testing Machines Div.*

For more data circle No. 50 on postcard, p. 135.

Turn Page



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far...*

*for*  
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# how DE-STA-CO makes specialties S.O.P.



## \* STANDARD OPERATING PROCEDURE

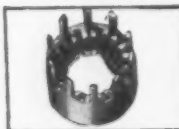
Forty years' experience in the stamping business has taught us the value of giving our customers certain processing procedures which are ordinarily considered "extras". This policy of considering your needs first is largely responsible for our consistently rapid growth.



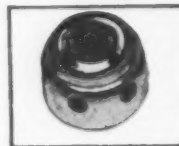
Close tolerance coining is one of the production methods that DeStaCo offers, not as a specialty, but as a Standard Operating Procedure. Our knuckle-action presses accommodate up to 400-ton capacity . . . frequently save you the additional expense of a grinding or machining operation.



Our precision parts department turns out critical stampings such as refrigerator intake and discharge valve reeds. These parts are made of heat-treated and ground imported DeStaCo valve steels. Our own Iso-Finish method provides a sealed-edge, strain-relieved surface for long life.



High-volume production of small, intricately-formed parts is done by Multi-Stamping. This is an entirely automatic method of processing complete parts in a single 4-slide machine. Progressive dies used in this operation are made in our own tool and die department.



Our production facilities include a number of high-speed, automatic presses to process your parts at the lowest possible unit cost. Our plant is best-suited to quantity production runs of light to medium-heavy fabrication up to  $\frac{3}{4}$ " material thickness. Our bed areas range from 10" x 12" to 48" x 72", pressures from 5 to 250 tons. We draw up to 4" deep.

Other DeStaCo specialties are Toggle Clamps for jigs and fixtures, Precision Washers, Arbor Spacers and Shims, Shim and Feeler Stock.

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## DETROIT STAMPING COMPANY

345 MIDLAND AVENUE • DETROIT 3, MICHIGAN

## —New Equipment—

Continued

### Safety hook

Greater safety to both men and equipment during lifting operations is offered by a new safety hook. It is simple and convenient enough so that hoist operators make full use of its safety locking feature. Once the hook is engaged, a stamped steel



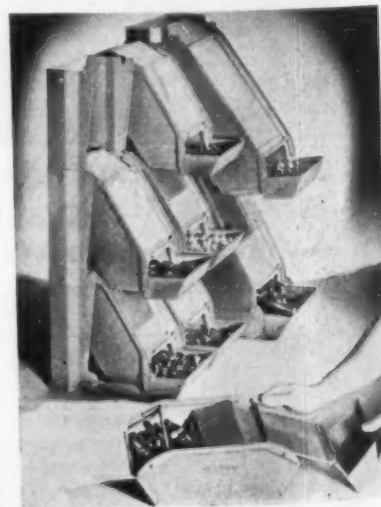
latch swings down and is securely held in place by a lock that is under spring tension. Slight pressure on the release unlocks the latch. Full throat opening when the latch swings up allows full use of the area inside the hook. *Coffing Hoist Co.*

For more data circle No. 51 on postcard, p. 135.

### Small parts hopper

New NesTier hopper racks increase efficiency of small parts handling in assembly and production operations. The rack and lid combination converts standard NesTier materials handling boxes into small parts hoppers. Lid and tray fit under the handles and snap into place. Available in two sizes, of all-welded heavy gage steel, for No. 120 and 175 NesTier boxes. *Chas. Wm. Doepke Mfg. Co., Inc.*

For more data circle No. 52 on postcard, p. 135.



## THE IRON AGE SUMMARY...

- ◀ Ingot rate tops 70 pct third week in a row
- ◀ But market still lacks steam for a big push
- ◀ Labor will be most important market factor

**Production . . .** Steelmaking operations continue to fluctuate within a narrow range. Gains and losses in the various steelmaking districts largely offset each other, leaving little overall change in the production pattern. The production trend is stable to strong; the outlook is for moderate increase within the next 30 days.

This week the industry is scheduled to operate at 70.5 pct of rated capacity, down 1 point from last week's revised rate, but half a point higher than was predicted for last week. Steel production index is estimated at 104.6 (1947-49 = 100).

**New Business . . .** New orders are coming in at a more rapid rate than they have for months. But most of them are small.

Steel sales officials are carefully screening their customer lists in a systematic effort to increase business. Efforts are quickly shifted to take full advantage of any improvement in demand for particular products. Pickups in some products are mostly offset by declines in others.

**Distribution . . .** Despite scattered improvement in demand from smaller customers, the market needs a strong boost to show more than

moderate improvement. A check of large steel consuming industries shows none that appears to have enough buying steam to bring that about before fall. The auto industry, usual pacemaker of steel buying, has become cautious.

**Outlook . . .** The most important factor in the steel market for the next 30 days or more will be labor. Any darkening of the labor picture would be quickly reflected in a strong burst of new orders. There will probably be more protective buying anyway, as the June 30 contract deadline approaches.

**Significance . . .** Scheduling of an ingot rate above 70 pct of capacity for the third consecutive week, means that steel production passed its lowpoint in March and April. The lowpoint on new orders was reached last October. For the next 30 days it will be difficult to tell how much improvement is real and how much is caused by strike-hedge buying.

**Prices . . .** Steelmaking scrap prices rose for the tenth consecutive week. Increases this week raised THE IRON AGE Steel Scrap Composite Price 17¢ a ton to \$28.25 per gross ton.

## Steel Output, Operating Rates

	This Week†	Last Week	Month Ago	Year Ago
Net Tons Produced (000 omitted)	1,680	1,712	1,637	2,262
Ingot Production Index (1947-49 = 100)	104.6	106.6	101.9	140.8
District Operating Rates				
Chicago	82.5	81.5	78.5	106.0
Pittsburgh	69.0	70.0*	71.0	99.0
Philadelphia	60.0	60.0	60.0	98.0
Valley	66.0	67.0	64.0	102.0
West	76.0	75.5*	56.5	108.0
Detroit	84.0	79.0	72.0	108.0
Buffalo	67.5	67.5	67.5	104.5
Cleveland	67.5	67.0	73.0	98.0
Birmingham	76.0	76.5	56.5	101.0
S. Ohio River	82.5	82.5	74.0	87.0
Wheeling	90.0	92.0*	90.0	104.0
St. Louis	34.5	73.5	55.5	89.5
East	58.5	50.5*	51.0	81.5
Aggregate	70.5	71.5*	68.5	100.5

\* Revised.  
† Tentative.

## Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
<b>Composite prices</b>				
Finished Steel, base . . . . .	4.634	4.634	4.634	4.417
Pig Iron (gross ton) . . . . .	\$56.59	\$56.59	\$56.59	\$55.26
Scrap, No. 1 hvy (gross ton) . . . . .	\$28.25	\$28.08	\$26.17	\$38.67
<b>Nonferrous</b>				
Aluminum, ingot . . . . .	21.50	21.50	21.50	20.50
Copper, electrolytic . . . . .	30.00	30.00	30.00	29.875
Lead, St. Louis . . . . .	13.80	13.80	13.80	13.05
Magnesium, ingot . . . . .	27.75	27.75	27.75	27.00
Nickel, electrolytic . . . . .	63.08	63.08	63.08	63.08
Tin, Straits, N. Y. . . . .	93.50	93.50	97.00	96.00
Zinc, E. St. Louis . . . . .	10.25	10.25	10.25	11.00

May 27, 1954



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ADDRESS DEPT. A-53

Above are shown two carbide metal rolls of identical composition. The one at the left cost the user about nine times as much as the one at the right. That differential was due solely to grinding vs. non-grinding. The plain face needed serrating, whereas the ready-toothed face needed nothing.

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## Steel Market Waiting For Push

Improved conditions for some products in some markets . . .  
A smattering of soft spots . . . Little strike-hedge buying  
. . . Missing automotive demand could brighten picture.

The steel market continues to fluctuate within a narrow range. There are some hopeful signs but a definite trend upward is still somewhere in the future. A pickup in one product is offset by a decline in another; an improvement one week is followed by a slump the next.

In the weekly product-by-product survey by IRON AGE editors in steel producing and consuming centers from east to west indicate that the long-awaited shot in the arm for steel is neither here nor just around the corner.

Automotive demand is the missing link despite improvement in bookings from scattered smaller consumers, including farm equipment and appliances. No pickup is looked for until buying for new models gets underway.

Disclosure of USW's contract demands might make some consumers jittery enough to step up their buying as insurance against a possible strike. But it may take a week or so for this to sink in. Tin plate consumers are the exception. They were burned in the 1952 walkout.

**Sheets and Strip . . . DETROIT** reports a pickup in hot-rolled sheet demand among small users, including building and construction. Automotive users continue to take their quota, but that's all. Cold-rolled sheet and strip is holding up, but only momentarily—a decline is looked for shortly. Automotive buyers in some instances are already closing out purchases for the current model year, and no pickup is possible until they start buying for 1955 models. In CHICAGO, demand is strong with considerable tonnage going into inventory. Major car builders, appliance, and farm equipment are providing the impetus. PITTSBURGH producers generally find the going strictly competitive. Electrical

### Purchasing Agent's Checklist

Iron and Steel	p. 161
Nonferrous Metals	p. 164
Scrap	p. 168
Used Machinery	p. 182
Locknuts	p. 82
Television	p. 76
Surplus Tools	p. 101
In Great Lakes Area	p. 69

sheet market is slow and decline has reached grain oriented due to downturn in transformer manufacture. Drop in electric motor output is big factor in general market picture.

**Bars . . .** The bar market leaves plenty to be desired. PITTSBURGH mills see little chance of improvement in second quarter and some are frankly pessimistic about the third. In CLEVELAND, hot-rolled bars have registered a slight pickup as some consumers strive to fill inventory holes. But both cold-rolled and alloy bars are moving slowly, and producers foresee little chance of improvement barring strike-hedge buying or considerable improvement in demand from automotive parts makers. DETROIT notes slight improvement in bar demand from small consumers. Automotive buying of alloy bars and forging billets continues depressed. Reinforcing bar demand is good in CLEVELAND and the EAST, although in the latter area the peak is believed to be over. CHICAGO area consumers have stepped up demand for cold-finished bars.

**Tubular Products . . .** Oil country goods are still the fair-haired boy of the industry. But even here, helter-skelter buying of last few years has been replaced by more deliberate scheduling on the part of consumers. Result, orders for third-quarter deliv-

ery are coming in more slowly than last year. Everybody admits the situation is more competitive, although heavy drillings would seem to spell out a good year for producers. Standard pipe demand is so-so.

**Wire Products . . .** In PITTSBURGH the buying peak for merchant products is over, but this has been balanced off by a decided pickup in manufacturer's wire. Construction products market is good. CLEVELAND reports startling increases in demand for reinforcing mesh for concrete, reflecting heavy road building programs.

**Plates . . .** Lack of demand from the railroads is restricting the market. A bright spot in the EAST is an upcoming contract from the Pennsylvania Railroad for 200 extra long "piggy-back" flat cars for hauling semi-trailers. In CHICAGO, production is holding up but order backlog is diminishing.

**Stainless and Specialty Steels . . .** Market generally is up slightly, but some producers say this is only the difference between very poor and poor. Strip demand, however, is "good to very good." Anticipated dairy industry pickup will hold sheet, light plate, and tubing demand. Chemical market has been off since 1952 but is no worse. Competition from aluminum is hurting sales for architectural applications. Producers getting some consolation from flattening of order curve in April and May, but no upturn is in sight for June. Third quarter would be earliest for significant pickup.

**Structurals . . .** Softening demand has extended to heavy structurals. Fabricated market has been hit by price cutting in the EAST as small contractors bid desperately on big jobs normally beyond their range. Larger fabricators say this is typical aftermath of a boom, may continue for six months to a year before dying natural death from too many losing jobs. Increased highway activity in Pennsylvania and New Jersey portends a good 1954 nevertheless. In the PACIFIC NORTHWEST, small mills reportedly are cutting prices on structurals and bars but larger producers are not even absorbing freight due to slim profit margins.

## Chilean Copper Deal Goes Through

**Buy 64,000 tons from Anaconda, 36,000 tons from Kennecott . . . Price is 30c per lb, delivered . . . Three firms said to want Texas City tin smelter—By R. L. Hatschek.**

Biggest news of the week was announcement of the purchase of 100,000 tons of Chilean copper for the U. S. strategic stockpile—finally. This has been in the works so long that it won't create so much as a ripple on the market's surface.

But what may turn out to be a sizable splash—particularly in zinc and lead—is the hearing held last Friday on the "new look" stockpiling program requested by the Administration. No information has been made public, but when the committee has prepared its recommendations it is expected that their substance will be divulged.

One problem that may get in the way of a quick start if the long-term plan is approved, is the question of funds. There seems to have been something of a mixup in assuming availability and accelerated stockpiling may run counter to budget pruners. In all probability, however, this can be straightened out and won't prove a stopper.

Big boost to the Administration in getting the Texas City tin smelter off government hands may be the fact that three firms are reported definitely interested in purchase or lease of the facilities.

**Copper . . .** Part of the 64,000 tons of Chilean copper bought by the government last week is already in the U. S. and is being turned over to the national stockpile immediately.

Remainder of the metal, purchased by General Services Administration from Anaconda Sales Co., will begin moving to this country very soon. Price of this material, including delivery to storage point, is 30c per lb.—less allowances—for cathode copper.

Contract with Kennecott Sales Corp. agent for the Central Bank of Chile, for delivery of 36,000 tons followed shortly. Price of 30c per lb. includes delivery to a storage point, but GSA will give allowances for fire-refined ingot copper.

While this siphons off 100,000 tons of Chilean copper, there is still a sizeable tonnage remaining—probably over 85,000 tons.

**Aluminum . . .** Following reductions in secondary aluminum ingot prices reported here last week, ingot makers have edged their scrap buying prices down slightly. Dealer scrap buying prices were definitely clipped this week—with some grades now quoted as much as 2c per lb less.

**Lead . . .** Demand for lead showed definite strengthening last week with sales totaling well ahead of the previous week. Most of the recent buying activity has been for prompt shipment—a further indication of the hand-to-

mouth buying policies of metal buyers today.

Statistically, April shipments were very nearly the same as March, with 47,161 tons of lead moving in April against 47,837 tons in the preceding month. Total lead shipments for the first 4 months were 168,657 tons, well ahead of the 154,069 tons during the first 4 months last year.

Representative Clifton Young, R., Nev., last week introduced in the House a bill to restrict lead and zinc imports. H. R. 9195 would limit these to 335,000 tons annually and 325,000 tons, respectively. It's the House counterpart of Sen. Dworshak's bill in the Senate.

**Zinc . . .** Other than the import restriction bill introduced in the House of Representatives (see Lead paragraph), there was very little doing in zinc last week. Sales were generally light, far from satisfactory when supply is considered.

Trading in zinc futures on the Commodity Exchange was reported quite active during the week.

Bureau of Mines statistics for March showed more than a 9000-ton gain in zinc consumption over the preceding month. Total for the month was 73,939 tons. Increase was attributed to gains in zinc-base alloys, galvanizing and brass and bronze. Despite the heavier use, consumer's zinc stocks increased some 4000 tons.

**Tin . . .** Reports from Washington indicate that at least three private firms have indicated the desire to purchase or lease the Texas City tin smelter. No hint was given as to who the interested parties may be but such a transaction would certainly solve the Administration's problem of disposal.

Belief in certain government circles is that long-term contracts could be signed with Bolivia, Indonesia and Thailand without any trouble. Such an assurance would be a big selling factor.

Regarding the argument that closing the smelter would hurt Bolivia's economy, it is now reported that foreign smelters have contracted to take all of Bolivia's production, including low-grade ores. The Texas City smelter was previously the only one which could use these low-grade ores.

### NONFERROUS METAL PRICES

(Cents per lb except as noted)

	May 19	May 20	May 21	May 22	May 24	May 25
Copper, electro, Conn. . . . .	30.00	30.00	30.00	30.00	30.00	30.00
Copper, Lake, delivered . . . .	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York . . . . .	93.50	93.50	93.00	93.50	93.50	93.50*
Zinc, East St. Louis . . . . .	10.25	10.25	10.25	10.25	10.25	10.25
Lead, St. Louis . . . . .	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices

\*Tentative





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Phone 6-2561 Teletype DV 588

May 27, 1954

165

# Nonferrous Prices

(Effective May 25, 1954)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

### Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136 in. and thicker, 2S, 8S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 76S-O, 76S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 76S-O, 76S-OAL, 46.9¢; 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 76S-O, 76S-OAL, 58.4¢.

Plate, 1/4-in. and heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 76S-O, 76S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 35.5¢ to 82.8¢; 12 to 14, 37.2¢ to 99.0¢; 24 to 26, 39.9¢ to 112.9¢; 36 to 38, 47.2¢ to 118.9¢.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.449-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, 1/4 to 11/32-in., 69.6¢ to 47.0¢; 3/8 to 1 1/2-in., 46.6¢ to 43.8¢; 1 1/2 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T6, OD 1 1/4 to 2-in., 31.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 33.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42% x 60 in., \$2.838; x 96 in., \$4.543; x 120 in., \$5.680; x 144 in., \$6.816. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢.

### Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: F51-O 1/4 in., 56¢; 3/16 in., 57¢; 1/8 in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 1/2 to 3/4 in., 60.5¢; 1 1/4 to 1.749 in., 56¢; 2 1/2 to 5 in., 51.5¢. Other alloys higher. Base up to 1/4 in. diam, 10,000 lb; 1/4 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.3 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/4 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness; OD, 1/4 to 5/16 in., \$1.43; 5/16 to 1/2 in., \$1.29; 1/2 to 3/4 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, 3/4 to 1 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1 1/4 in., 10,000 lb; 1 1/4 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

### Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$11; Bar, HR or forged, \$6; Forgings, \$6.

### Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86 1/4	67 1/2	92 1/2
Strip, CR	92 1/4	70 1/2	98 1/2
Rod, bar	82 1/4	65 1/2	88 1/2
Angles, HR	82 1/4	65 1/2	88 1/2
Plate, HR	84 1/4	66 1/2	90 1/2
seamless tube	115 1/2	100 1/2	137 1/2
Shot, blocks	60		

### Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41		48.48
Copper, h-r	48.38	44.73	
Copper, drawn		45.98	
Low brass	44.47	44.41	
Yellow brass	41.72	41.66	
Red brass	45.44	45.38	
Naval brass	45.76	40.07	41.33
Leaded brass			39.11
Com. bronze	46.95	46.89	
Mang. bronze	49.48	42.62	45.18
Phos. bronze	66.58	67.08	
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36		62.63

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb cont'd be	\$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	\$72.75
Bismuth, ton lots	\$2.25
Cadmium, del'd	\$1.70
Cobalt, 97-99% (per lb)	\$2.60 to \$2.67
Copper, electro, Conn. Valley	30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$165 to \$175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	27.00
ingot	27.75
Magnesium, sticks, 100 to 500 lb, 46.00 to 48.00	
Mercury, dollars per 76-lb flask, f.o.b. New York	\$255 to \$260
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	\$21.00
Platinum, dollars per troy oz.	\$84 to \$87
Silver, New York, cents per oz.	85.25
Tin, New York	93.50
Titanium, sponge, grade A-1	\$4.72
Zinc, East St. Louis	10.25
Zinc, New York	10.75
Zirconium copper, 50 pct	\$6.20

## REMELTED METALS

### Brass Ingot

(Cents per lb delivered carloads)

85-5-5-5 ingot	
No. 115	27.00
No. 120	26.25
No. 123	25.75
80-10-10 ingot	
No. 305	31.50
No. 315	29.25
88-10-2 ingot	
No. 210	41.25
No. 215	37.75
No. 245	33.25
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	26.75

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	23.25-24.00
0.60 copper, max.	23.00-23.75
Piston alloys (No. 122 type)	20.00-22.00
No. 12 alum. (No. 2 grade)	19.75-20.25
108 alloy	20.00-21.00
195 alloy	21.50-22.00
13 alloy (0.60 copper max.)	23.00-23.75
ASX-679	20.00-21.00

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-96-97 1/4%	20.50-21.00
Grade 2-82-95%	19.00-19.50
Grade 3-90-92%	18.00-18.50
Grade 4-85-90%	17.00-17.50

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	42.64
Electrodeposited	41.88
Flat rolled	45.04
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	\$1.75
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94%

### Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75 1/2
Sodium cyanide, 95 pct domestic	
200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25 1/4
Yellow brass	19%	18
Red brass	23	22 1/4
Comm. bronze	23%	23 1/4
Mang. bronze	18%	17 1/4
Yellow brass rod ends	19%	

### Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27	27 1/4
No. 2 copper wire	25 1/4	25 1/4
Light copper	24	24 1/4
*Refinery brass		23 1/4
*Dry copper content		

### Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27
No. 2 copper wire	25 1/4
Light copper	24
No. 1 composition	21 1/4
No. 1 comp. turnings	20 1/4
Rolls brass	17
Brass pipe	18 1/4
Radiators	17

### Aluminum

Mixed old cast	12	12 1/2
Mixed new clips	13	14
Mixed turnings, dry	12 1/2	13 1/4
Pots and pans	12	13

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

### Copper and Brass

No. 1 heavy copper and wire	24 1/4-25
No. 2 heavy copper and wire	23
Light copper	21
New type shell cuttings	20 1/4
Auto radiators (unsweated)	15
No. 1 composition	19
No. 1 composition turnings	18 1/4-19
Unlined red car boxes	16
Cocks and faucets	16
Mixed heavy yellow brass	13
Old rolled brass	15 1/4
Brass pipe	16 1/4-17
New soft brass clippings	17 1/4-18
Brass rod ends	15
No. 1 brass rod turnings	14

### Aluminum

Alum. pistons and struts	7	8
Aluminum crankcases		10
2S aluminum clippings		13
Old sheet and utensils		10
Borings and turnings	6	7
Misc. cast aluminum		10
Dural clips (24S)		11

### Zinc

New zinc clippings	5 1/4-6
Old zinc	4 1/4-4 1/2
Zinc routings	3 1/4-3 1/2
Old die cast scrap	3 1/4-3 1/2

### Nickel and Monel

Pure nickel clippings	60	65
Clean nickel turnings		40
Nickel anodes	60	65
Nickel rod ends	60	65
New Monel clippings	23	25
Clean Monel turnings	16	18
Old sheet Monel	21	23
Nickel silver clippings, mixed		15
Nickel silver turnings, mixed		13

### Lead

Soft scrap lead	11	11 1/4
Battery plates (dry)	5 1/4	6
Batteries, acid free		4 1/4

### Magnesium

Segregated solids	18 1/4-19
Castings	17 1/4-18

### Miscellaneous

Block tin	75	80
No. 1 pewter	55	60
No. 1 auto babbitt	45	48
Mixed common babbitt	12 1/4-13	
Solder joints	15 1/4-15 1/2	16 1/4
Siphon tops		45
Small foundry type	15 1/4-15 1/2	
Monotype	13 1/4-14	
Lino. and stereotype	13	13 1/4
Electrotype	11 1/4-11 1/2	
Hand picked type shells	8	8 1/4
Lino. and stereo. dross	5 1/4-5 1/2	
Electro dross	3 1/4-4	

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3 1/4 —14  
3 —13 1/4  
1 1/4 —11 1/4  
8 —8 1/4  
5 1/4 —5 1/4  
3 1/2 —4

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# Iron and Steel Scrap Markets

## Price Climb Running Out of Gas

**Despite minor price increases in some scrap centers, the market may be nearing the level-off point . . . Steel labor negotiations slow the market . . . Composite at \$28.25.**

Recent spurt in scrap prices is slowing, may now be near the level-off point. There were minor increases in a few scrap centers but generally the market is softening.

One factor depressing the market is the current steel labor negotiations. Consumers are holding down their inventories until they have a better idea of what's going to happen.

Chicago continues to be most active scrap area, though the pace is faltering. Cast remains in good demand in all sectors while No. 2 bundles are going begging as mills concentrate on quality production because of increased competition.

THE IRON AGE Scrap Composite Price rose 17¢ to \$28.25.

**Pittsburgh . . .** Steel labor negotiations have become a factor in the market. Consumers are tending to hold down scrap inventories until the labor picture becomes more defined. One mill is said to be pressing for lower price on No. 1 heavy melting but has been unable to pick up a tonnage. Prices are firm but unchanged. Due to emphasis on quality for competitive reasons, mills generally have lost interest in No. 2 bundles.

**Chicago . . .** Despite an upward movement of the bottom of many price spreads, new prices at the top of the spread indicated little new strength, and buying activity in this area was slowing slightly in the past week. A tonnage order in turnings had the effect of halting the upward movement of that grade, though it is reported there was some difficulty in filling the order entirely. Railroad grades continue to show considerable strength, as was expected when broker buying prices in this grade continued to edge up as early as 2 weeks ago despite little climb in consumer buying in that

period. No. 2 dealer bundles are again in trouble.

**Philadelphia . . .** Local market is largely unchanged pricewise but there's weaker sentiment as far as mill purchasing is concerned. Brightest ray in the steelmaking scrap scene is a boatload of openhearth material reported to be going to Europe next month from this area at higher than prevailing prices.

**New York . . .** The market for steelmaking scrap is very quiet here this week. Out-of-area customers have stopped buying. Blast furnace grades continue very slow. Cast is still moving into foundries at a good rate. Prices are unchanged except for clean cast chemical borings which fell \$2 to a \$16 to \$17 range.

**Detroit . . .** The month-end lull that precedes the closing of automotive list bidding prevails here this week. Some signs point to a little less activity on the lists than has characterized this market in recent months. Brokers believe there is less incentive for the two major consuming areas to grab off large tonnages. Bundles of top quality remain strong, but weaknesses are noted in No. 2 and blast furnace grades. Detroit foundries have slackened their output and cast is showing signs of weakness after months of a stable market.

**Cleveland . . .** Prices held steady this week but there were signs of a possible price decrease. At press time one local consumer had taken off five openhearth. Another mill in the valley reportedly is out of the market for the time being. Many brokers expect a drop of at least \$1 in open hearth grades within the next 10 days.

**Birmingham . . .** Cast scrap prices advanced another dollar this week as supplies continued scarce. Electric furnace scrap also moved up-

ward, with one company paying an additional premium for rerolling rails. Other grades were unchanged. Some scrap was sold in north Florida for export.

**St. Louis . . .** Rails continue as the strong feature of the scrap market in the St. Louis industrial district. Offerings are light and the demand is strong with no prospects of increased supplies soon. Random length rails and 18 in. and under are respectively \$2 and \$3 a ton higher. Foundry grades are in better demand and some prices are higher. Receipts are improving.

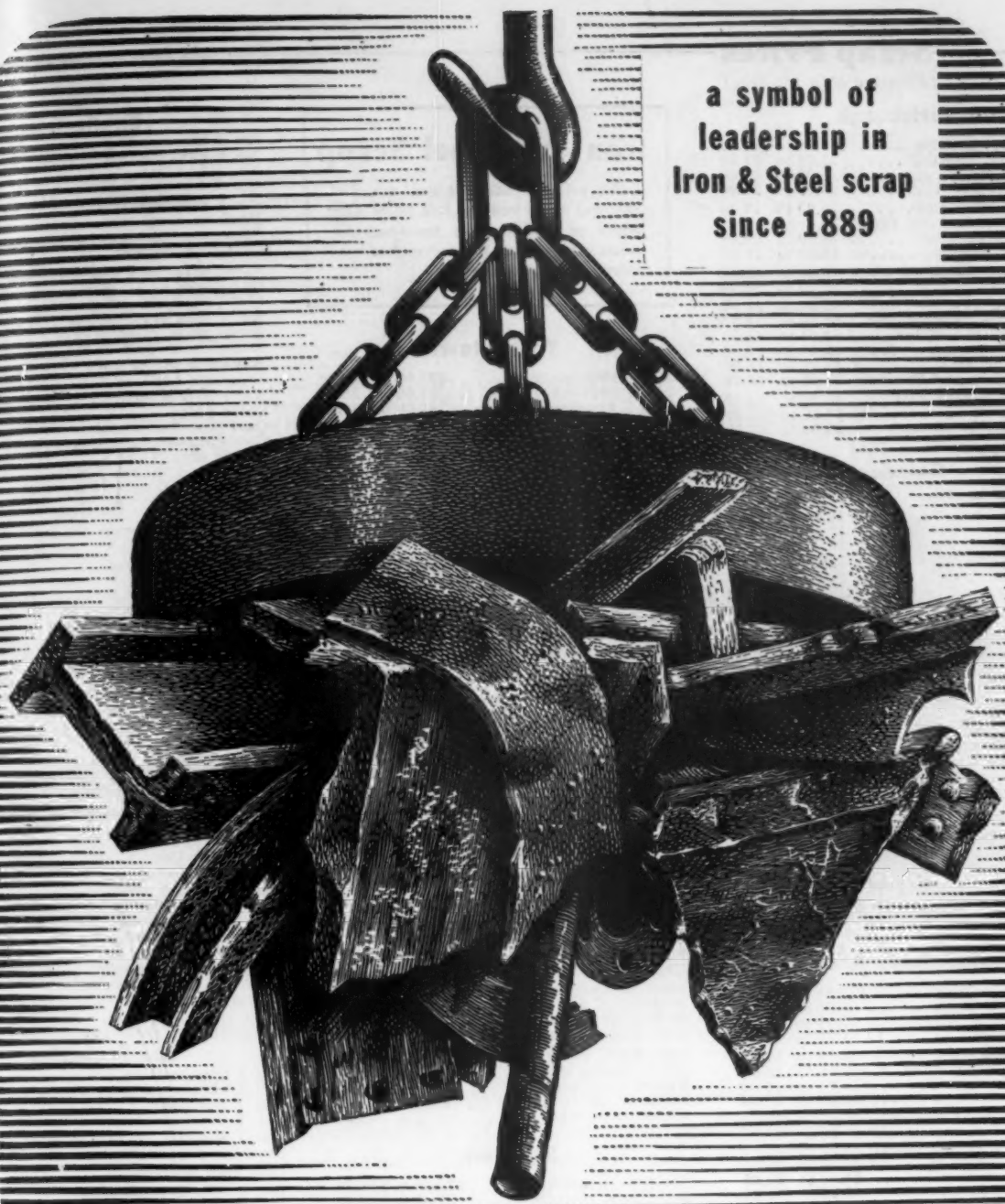
**Cincinnati . . .** Low phos dropped \$1 to \$33 and drop broken cast went down \$1 to \$45 on the basis of representative sales. Real significance of these lower prices probably will not be determined until bidding on industrial lists is completed this week. At the moment there is real doubt as to whether prices for low phos and cast are bearish straws or just local signs of overpurchasing.

**Buffalo . . .** Price advances ranging from 50¢ to \$2 per ton were posted in the scrap market here. Valley buying boosted No. 1 heavy melting \$1 a ton to \$26 to \$27. Blast furnace items jumped 50¢ and \$1 on local mill buying while low phos was up \$2. Cast continues strong with new business lifting prices \$2.

**Boston . . .** New England scrap traders reported no sales of No. 2 steelmaking grades or chemical borings this week. In general, the temporary upward spurt seems to have subsided for the moment at least. No local consumers are buying and some foresee a return to earlier, lower prices.

**West Coast . . .** Cast continued to be the hottest scrap item with San Francisco's top range up \$1.50 to a \$41-\$44 spread and Los Angeles up \$1 to \$42. Dealers were scouring the entire area and bringing in cast at \$12-\$15 freight bills to meet demand. Short supply is due to decline of auto wrecking because of depressed steel scrap market.

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May 27, 1954

# Scrap Prices

(Effective May 25, 1954)

## Pittsburgh

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and ms. turns.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs, plate	33.00 to 34.00
Heavy turnings	28.00 to 29.00
No. 1 RR. hvy. melting	32.00 to 33.00
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft and under	43.00 to 44.00
RR. steel wheels	35.00 to 36.00
RR. spring steel	35.00 to 36.00
RR. couplers and knuckles	35.00 to 36.00
No. 1 machinery cast.	43.00 to 44.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	31.00 to 32.00

## Chicago

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 factory bundles	32.00 to 33.00
No. 1 dealers' bundles	30.00 to 31.00
No. 2 dealers' bundles	22.00 to 23.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	37.00 to 38.00
Low phos. punch'gs, plate	33.00 to 34.00
Low phos. 3 ft and under	32.00 to 33.00
No. 1 RR. hvy. melting	32.00 to 34.00
Scrap rails, random lgth.	36.00 to 38.00
Rerolling rails	42.00 to 43.00
Rails 2 ft and under	44.00 to 46.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	36.00 to 37.00
Angles and splice bars	37.00 to 38.00
RR. steel car axles	39.00 to 40.00
RR. couplers and knuckles	35.00 to 36.00
No. 1 machinery cast.	41.00 to 43.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	31.00 to 32.00
Cast iron brake shoes	36.00 to 37.00
Cast iron car wheels	34.00 to 35.00
Malleable	40.00 to 42.00
Stove plate	31.00 to 32.00

## Philadelphia Area

No. 1 hvy. melting	\$22.00 to \$23.50
No. 2 hvy. melting	20.00 to 21.50
No. 1 bundles	23.00 to 24.50
No. 2 bundles	18.00 to 19.00
Machine shop turn.	12.00 to 13.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Clean cast chem. borings	22.00 to 23.00
Low phos. 5 ft and under	27.00 to 28.00
Low phos. 2 ft and under	28.00 to 29.00
Low phos. punch'gs	28.00 to 29.00
Elec. furnace bundles	24.00 to 25.00
Heavy turnings	21.00 to 22.00
RR. steel wheels	31.00 to 32.00
RR. spring steel	31.00 to 32.00
Rails 18 in. and under	41.00 to 42.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	35.00 to 36.00
Cast iron car wheels	38.00 to 39.00
Malleable	38.00 to 39.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	39.00 to 40.00
Charging box cast.	36.00 to 37.00

## Cleveland

No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	28.00 to 29.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut struct'l & plate, 2 ft & under	33.50 to 34.50
Drop forge flashings	28.00 to 29.00
Low phos. 2 ft & under	29.00 to 30.00
No. 1 RR. heavy melting	29.00 to 30.00
Rails 3 ft and under	44.00 to 45.00
Rails 18 in. and under	45.00 to 46.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	19.00 to 20.00
Railroad cast.	41.00 to 42.00
No. 1 machinery cast.	42.00 to 43.00
Stove plate	34.00 to 35.00
Malleable	40.00 to 41.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. plate	31.00 to 32.00

## Buffalo

No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 busheling	26.00 to 27.00
No. 1 bundles	26.00 to 27.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	17.50 to 18.50
Shoveling turnings	18.00 to 18.50
Cast iron borings	17.50 to 18.50
Low phos. plate	29.00 to 30.00
Scrap rails, random, lgth.	33.00 to 34.00
Rails 2 ft and under	40.00 to 41.00
RR. steel wheels	34.00 to 35.00
RR. spring steel	34.00 to 35.00
RR. couplers and knuckles	34.00 to 35.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	39.00 to 40.00

## Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles, openhearth	23.00 to 24.00
No. 2 bundles	19.00 to 20.00
New busheling	21.00 to 22.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Low phos. punch's, plate	22.00 to 23.00
No. 1 cupola cast.	36.00
Heavy breakable cast.	26.00
Stove plate	31.00
Automotive cast.	39.00

## St. Louis

No. 1 hvy. melting	\$25.00 to \$26.00
No. 2 hvy. melting	23.50 to 24.50
No. 1 bundles	25.00 to 26.00
No. 2 bundles	19.50 to 20.50
Machine shop turn.	12.00 to 13.00
Cast iron borings	13.00 to 14.00
Shoveling turnings	13.00 to 14.00
No. 1 RR. hvy. melting	29.50 to 30.50
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	43.00 to 44.00
Locomotive tires, uncut	32.00 to 33.00
Angles and splice bars	31.00 to 32.00
Std. steel car axles	40.00 to 41.00
RR. spring steel	32.50 to 33.50
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Stove plate	37.00 to 38.00
Cast iron car wheels	30.00 to 31.00
Malleable	37.00 to 38.00
Unstripped motor blocks	27.00 to 28.00

## New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$17.00 to \$18.00
No. 2 hvy. melting	15.00 to 16.00
No. 2 bundles	14.00 to 15.00
Machine shop turn.	5.00 to 6.00
Mixed bor. and turn.	7.00 to 8.00
Shoveling turnings	8.00 to 9.00
Clean cast chem. borings	16.00 to 17.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	29.00 to 30.00
Unstripped motor blocks	22.00 to 23.00

## Birmingham

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	18.00
No. 1 bundles	20.00
No. 2 bundles	\$15.00 to 16.00
No. 1 busheling	20.00
Machine shop turn.	13.00
Shoveling turnings	15.00
Cast iron borings	13.00 to 14.00
Electric furnace bundles	25.00 to 26.00
Bar crops and plate	29.00 to 30.00
Structural and plate, 2 ft	29.00 to 30.00
No. 1 RR. hvy. melting	26.00 to 27.00
Scrap rails, random lgth.	34.00 to 35.00
Rails, 18 in. and under	37.50 to 38.50
Angles & splice bars	36.00 to 37.00
Rerolling rails	37.00 to 38.00
No. 1 cupola cast.	43.00 to 44.00
Stove plate	40.00 to 41.00
Cast iron car wheels	33.00 to 34.00
Charging box cast.	19.00 to 20.00
Heavy breakable	40.00 to 41.00
Unstripped motor blocks	34.00 to 35.00
Mashed tin cans	15.00 to 16.00

## Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$16.50 to \$17.00
No. 2 hvy. melting	15.00 to 15.25
No. 1 bundles	16.50 to 17.00
No. 2 bundles	13.00 to 13.25
No. 1 busheling	16.50 to 17.00
Elec. furnace, 3 ft & under	17.00
Machine shop turn.	3.00 to 4.00
Mixed bor. and short turn.	5.00 to 6.00
Shoveling turnings	7.00 to 7.50
Clean cast chem. borings	11.00 to 12.00
No. 1 machinery cast.	37.00 to 38.00
Mixed cupola cast.	36.00 to 37.00
Heavy breakable cast.	23.50 to 24.00
Stove plate	24.00 to 25.00
Unstripped motor blocks	7.00 to 8.00

## Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$25.00 to \$26.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 bundles	25.00 to 26.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.50 to 14.50
Shoveling turnings	13.50 to 14.50
Cast iron borings	13.50 to 14.50
Low phos. 18 in. & under	32.00 to 33.00
Rails, random lengths	27.00 to 28.00
Rails, 18 in. and under	44.00 to 45.00
No. 1 cupola cast.	34.00 to 35.00
Hvy. breakable cast.	36.00 to 37.00
Drop broken cast.	44.00 to 45.00

## San Francisco

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	22.00
No. 1 cupola cast.	\$41.00 to 44.00

## Los Angeles

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	17.00
No. 2 bundles	\$13.50 to 14.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Shoveling turnings	\$7.00 to 9.00
Cast iron borings	7.00 to 8.00
Elec. fur. 1 ft and under	25.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	39.00 to 42.00

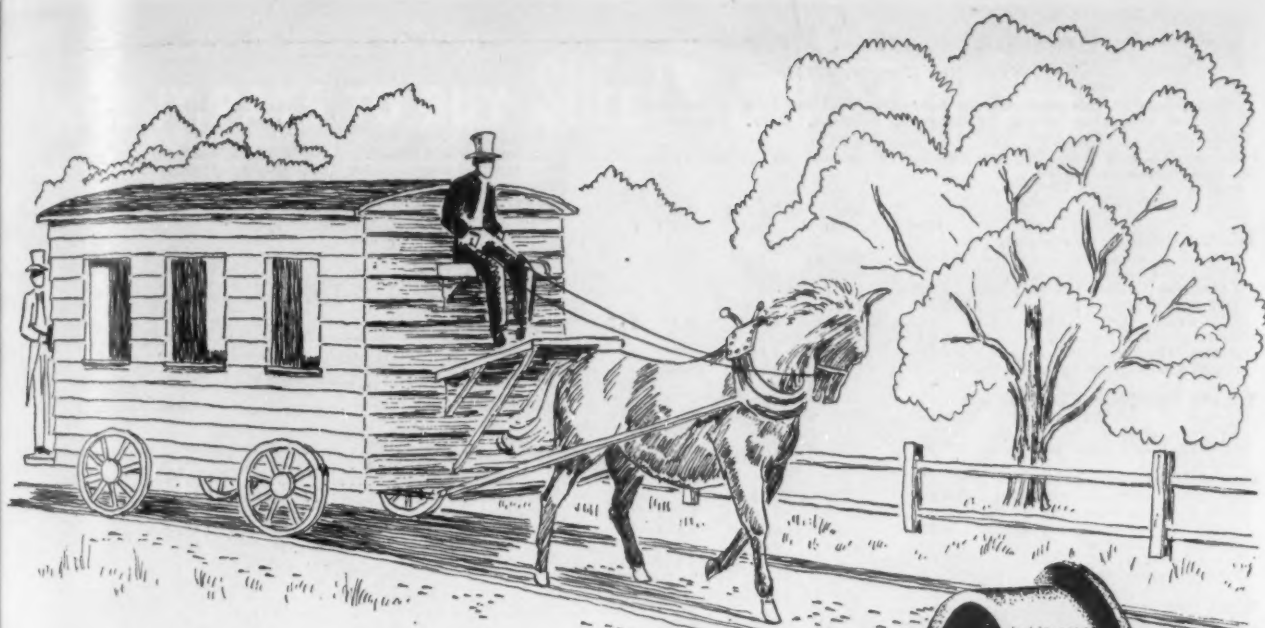
## Seattle

No. 1 hvy. melting	\$23.00
No. 2 hvy. melting	19.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	12.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

## Hamilton, Ont.

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bushelings	17.00
Bush., new fact prep'd.	20.00
Bush., new fact unprep'd.	16.00
Short steel turnings	12.00
Mixed bor. and turn.	31.00
Rails, remelting	42.00 to 45.00
Cast scrap	





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# Comparison of Prices

(Effective May 25, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	May 25 1954	May 18 1954	Apr. 27 1954	May 26 1954
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.513	5.513	5.513	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	39.75
<b>Tin and Terneplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. terms	7.75	7.75	7.75	7.75
<b>Bars and Shapes: (per pound)</b>				
Merchant bars	4.16¢	4.16¢	4.16¢	3.95¢
Cold finished bars	5.22	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	34.00
Wrought iron bars	10.40	10.40	10.40	10.05
<b>Wire: (per pound)</b>				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢
<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$4.325	\$4.325	\$4.325	\$4.075
Light rails	5.20	5.20	5.20	5.00
<b>Semifinished Steel: (per net ton)</b>				
Re-rolling billets	\$62.00	\$62.00	\$62.00	\$59.00
Slabs, re-rolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slab	82.00	82.00	82.00	76.00
<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55
<b>Finished Steel Composite: (per pound)</b>				
Base price	4.634¢	4.634¢	4.634¢	4.417¢

## Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

## Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

## Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	May 25 1954	May 18 1954	Apr. 27 1954	May 26 1954
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$61.19	\$61.19	\$61.19	\$60.49
Foundry, Valley	56.50	56.50	56.50	56.50
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.50
Foundry, Birmingham	52.88	52.88	52.88	51.20
Foundry, Chicago	56.50	56.50	56.50	56.00
Basic del'd, Philadelphia	60.27	60.27	60.27	59.77
Basic, Valley furnace	56.00	56.00	56.00	54.50
Malleable, Chicago	56.50	56.50	56.50	55.50
Malleable, Valley	56.50	56.50	56.50	55.50
Ferromanganese, cents per lb.	10.00¢	10.00¢	10.00¢	9.80¢
† 76 pct Mn base.				
<b>Pig Iron Composite: (per gross ton)</b>				
Pig iron	\$56.50	\$56.50	\$56.50	\$55.38
<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$30.50	\$30.50	\$27.50	\$38.50
No. 1 steel, Phila. area	22.75	22.75	21.50	40.50
No. 1 steel, Chicago	31.50	31.00	29.50	37.00
No. 1 bundles, Detroit	23.50	23.50	18.00	36.50
Low phos., Youngstown	31.50	31.50	31.50	44.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	42.50	45.50
No. 1 mach'y cast, Philadel'a	39.50	39.50	39.50	47.50
No. 1 mach'y cast, Chicago	42.00	41.00	41.00	42.00
<b>Steel Scrap Composite: (per gross ton)</b>				
No. 1 heavy melting scrap	\$28.25	\$28.08	\$26.17	\$38.67
<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.38	\$14.38	\$14.38	\$14.75
Foundry coke, prompt	16.75	16.75	16.75	17.25
<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	30.00	30.00	30.00	29.50†
Copper, Lake, Conn.	30.00	30.00	30.00	....
Tin, Straits, New York	93.50†	93.50	97.00	96.00
Zinc, East St. Louis	10.25	10.25	10.25	11.00
Lead, St. Louis	13.50	13.50	13.50	13.50
Aluminum, virgin ingot	21.50	21.50	21.50	20.50
Nickel, electrolytic	63.08	63.08	63.08	63.08
Magnesium, ingot	27.75	27.75	27.75	27.00
Antimony, Laredo, Tex.	28.50	28.50	28.50	24.50

† Tentative. ‡ Average. \* Revised.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on p. 177 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem B3...	58.00	58.50	59.00	59.50	.....
Birmingham R3...	52.38	52.88	.....	.....	.....
Birmingham W9...	52.38	52.88	.....	.....	.....
Birmingham S5...	52.38	52.88	.....	.....	.....
Buffalo R3...	56.00	56.50	57.00	.....	.....
Buffalo H1...	56.00	56.50	57.00	.....	.....
Buffalo W6...	56.00	56.50	57.00	.....	.....
Chicago I4...	56.00	56.50	57.00	57.00	.....
Cleveland A5...	56.00	56.50	56.50	57.00	61.00
Cleveland R3...	56.00	56.50	56.50	.....	.....
Dairfield L3...	52.50	52.50	52.50	.....	.....
Duluth I4...	56.00	56.50	56.50	57.00	.....
Erie I4...	56.00	56.50	56.50	57.00	.....
Everett M6...	.....	61.25	61.75	.....	.....
Fontana K1...	62.00	62.50	.....	.....	.....
Geneva, Utah C7...	56.00	56.50	.....	.....	.....
Granite City G2...	57.90	58.40	58.90	.....	.....
Hubbard Y1...	.....	.....	56.50	.....	.....
Minnequa C6...	58.00	59.00	59.00	.....	.....
Monessen P6...	56.00	.....	.....	.....	.....
Neville Isl. P4...	56.00	56.50	56.50	.....	.....
Pittsburgh U1...	56.00	.....	.....	57.00	.....
Sharpsville S3...	56.00	56.50	56.50	57.00	.....
Steelton B3...	58.00	58.50	59.00	59.50	64.00
Swedeland A2...	58.00	58.50	59.00	59.50	.....
Teledo I4...	56.00	56.50	56.50	57.00	.....
Troy, N. Y. R3...	58.00	58.50	59.00	59.50	64.00
Youngstown Y1...	.....	.....	56.50	57.00	.....
N. Tonawanda T1...	.....	56.50	57.00	.....	.....

**DIFFERENTIALS:** Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for .05 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

**Silvery Iron:** Buffalo, H1, \$68.25; Jackson, J1, G1, \$67.00. Add \$1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add \$1 per ton for 0.75 pct. or more phosphorus. Add 75¢ for each 0.50 pct. manganese over 1.0 pct. Bessemer ferrosilicon prices are \$1 over comparable silvery iron.

## STAINLESS STEEL

Base price cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingot, re-rolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, re-rolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	58.75	45.75	51.25	30.00	30.50	30.50
Sheets	38.25	41.50	48.75	43.75	62.75	50.50	59.25	34.25	41.25	34.75
Strip, hot-rolled	29.75	32.00	36.75	34.25	53.25	41.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	62.75	50.50	59.25	34.25	41.25	34.75

## STAINLESS STEEL PRODUCING POINTS:

**Sheets:** Midland, Pa. C11; Brackenridge, Pa. A3; Butler, Pa. A7; McKeesport, Pa. U1; Washington, Pa. W2, J2; Baltimore, Md. E1; Middletown, O. A7; Massillon, O. R3; Gary, Ind. U1; Bridgeville, Pa. U2; New Castle, Ind. J2; Ft. Wayne, Ind. J4.

**Strip:** Midland, Pa. C11; Cleveland, A5; Carnegie, Pa. S9; McKeesport, Pa. F1; Reading, Pa. C2; Washington, Pa. W2; W. Leeburg, Pa. A3; Bridgeville, Pa. U2; Detroit, M2; Canton-Massillon, O. R3; Middletown, O. A7; Harrison, N. J. D3; Youngstown, O. S1; Sharon, Pa. S1; Butler, Pa. A7; Wallingford, Conn. U3 (.25¢ per lb higher) W1 (.25¢ per lb higher); New Bedford, Mass. R6.

**Bar:** Baltimore, A5; Massillon, O. R3; McKeesport, Pa. F1; Ft. Wayne, J4; Harrison, N. J. D3; Baltimore, Md. J2; McKeesport, Pa. U1, F1; Bridgeville, Pa. U2; Dunkirk, N. Y. A3; Massillon, O. R3; Chicago, Ill. U1; Syracuse, N. Y. C1 I; Watervliet, N. Y. A3; Waukegan, Ill. Canton, O. T5; Ft. Wayne, Ind. J4.

**Wire:** Waukegan, Ill. Massillon, O. R3; McKeesport, Pa. F1; Ft. Wayne, J4; Harrison, N. J. D3; Baltimore, Md. Dunkirk, N. Y. A3; Monessen, Pa. U1; Syracuse, Ill. Bridgeville, Pa. U2.

**Structurals:** Baltimore, A7; Massillon, O. R3; Chicago, Ill. J4; Watervliet, N. Y. A3; Syracuse, Ill. C11.

**Plates:** Brackenridge, Pa. A3; Chicago, Ill. Munhall, Pa. U1; Midland, Pa. C11; New Castle, Ind. J2; Middletown, A7; Washington, Pa. J2; Cleveland, Massillon, R3; Coatesville, Pa. C15.

**Forged discs, die blocks, rings:** Pittsburgh, C11; Syracuse, Ill. Ferndale, Mich. A3; Washington, Pa. J2.

**Forging billets:** Midland, Pa. C11; Baltimore, A7; Washington, Pa. J2; McKeesport, Pa. F1; Massillon, Canton, O. R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, Ill. C11.

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## U. S. STEEL SUPPLY

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**Warehouses and Sales Offices  
Coast to Coast**



**UNITED STATES STEEL**

May 27, 1954

173



IRON AGE		<i>Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.</i>												
	<b>STEEL PRICES</b> <i>(Effective May 25, 1954)</i>	BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.			\$52.00 B3		4.15 B3	6.20 B3	4.15 B3						
	Buffalo, N. Y.	\$62.00 B3	\$75.50 B3, R3	\$82.00 B3, R3	4.925 B3	4.15 B3	6.30 B3	4.15 B3	3.925 B3, R3	5.45 B3	6.00 B3	8.425 B3		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.05 A2		5.90 A2			
	New Bedford, Mass.									6.00 R6				
	Harrison, N. J.													12.00 C1
	Johnstown, Pa.	\$62.00 B3	\$75.50 B3	\$82.00 B3		4.15 B3	6.20 B3							
	Fairless, Pa.													
	New Haven, Conn.									5.90 D1, 6.20 A5				
	Phoenixville, Pa.					4.15 P2		4.15 P2						
MIDDLE WEST	Sparrows Pt., Md.								3.925 B3	5.45 B3	6.00 B3	8.425 B3		
	Wallingford, Conn.									5.90 W1				
	Worcester, Mass.									6.30 A5				12.30 A5 12.45 N7
	Alton, Ill.								4.10 L1					
	Ashland, Ky.								3.925 A7					
	Canton-Massillon, Dover, Ohio			\$82.00 R3, T5										12.00 G4
	Chicago, Ill.	\$62.00 U1	\$75.50 R3, U1, W8	\$82.00 U1, W8, R3	4.925 U1	4.10 U1, W8	6.175 U1, Y1	4.10 U1	3.925 A1, W8	5.70 A1	5.95 R3		6.40 W8	
	Cleveland, Ohio		\$75.50 R3							5.45 A5, J3		7.80 J3 8.15 A5		12.00 A5 12.15 N7
	Detroit, Mich.			\$84.00 R5					4.075 G3 4.15 M2	5.60 D1, D2, G3, M2, P11	6.10 G3	7.90 D2 8.30 G3		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$62.00 U1	\$75.50 U1	\$82.00 U1, Y1	4.925 J3	4.10 J3, U1	6.175 U1, J3		3.925 J3, U1, Y1	5.70 J3	5.95 U1, J3 6.45 Y1		6.40 U1	
	Granite City, Ill.													
	Indianapolis, Ind.									5.60 C5				
	Mansfield, Ohio													
	Middletown, Ohio									5.45 A7				
	Niles, Warren, Ohio Sharon, Pa.								3.925 S1	5.45 S1, T4	5.95 S1	7.65 S1	6.40 S1	12.00 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$62.00 U1, J3	\$75.50 J3, U1	\$82.00 U1, C11	4.925 U1	4.10 J3, U1	6.175 J3, U1	4.10 U1	3.925 A7, P6 3.95 S7 4.425 S9	5.45 B4, J3, S7		7.80 J3	6.40 S9 6.45 S7	12.00 S9 12.15 S7
	Portsmouth, Ohio								3.925 P7					
	Weirton, Wheeling, Follansbee, W. Va.					4.10 W3			3.925 W3	5.45 F3, W3	5.95 W3	8.15 W3		
	Youngstown, Ohio			\$82.00 Y1, C10		4.10 Y1	6.675 Y1		3.925 R3, U1, Y1	5.45 R3, Y1, C5	5.95 U1, R3 6.45 Y1	7.60 R3 8.30 Y1	6.40 U1	12.00 C5
WEST	Fontana, Cal.	\$70.00 K1	\$83.50 K1	\$101.00 K1		4.75 K1	6.825 K1	5.10 K1	4.70 K1	7.35 K1	7.05 K1		7.80 K1	13.65 K1
	Geneva, Utah		\$75.50 C7			4.10 C7	6.175 C7							
	Kansas City, Mo.					4.70 S2	6.775 S2		4.525 S2		6.55 S2		7.00 S2	
	Los Angeles, Torrance, Cal.		\$85.00 B2	\$102.00 B2		4.80 B2, C7	6.85 B2		4.675 B2, C7	7.50 C1			7.60 B2	
	Minnequa, Colo.					4.55 C6			5.025 C6					
	San Francisco, Niles, Pittsburg, Cal.		\$85.00 B2			4.75 B2 4.91 P9	6.80 B2		4.675 B2, C7					
	Seattle, Wash.		\$89.00 B2			4.85 B2	6.90 B2							
	Atlanta, Ga.								4.125 A8					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$62.00 T2	\$75.50 T2			4.10 R3, T2	6.175 T2		3.925 R3, T2, C16		5.95 T2			
	Houston, Tex.		\$83.50 S2	\$90.00 S2		4.50 S2			4.325 S2				6.80 S2	

STEEL  
PRICES(Effective  
May 25, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	SHEETS										WIRE ROD	TINPLATE†		BLACK PLATE
	Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized 10 ga.	Enamel- ing 12 ga.	Long Torne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.			Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
Bethlehem, Pa.														
Buffalo, N. Y.	3.925 B3	4.775 B3				5.90 B3	7.225 B3			4.525 W6				
Claymont, Del.														
Coatesville, Pa.														
Conschocken, Pa.	3.975 A2					5.90 A2								
Harrisburg, Pa.														
Hartford, Conn.														
Johnstown, Pa.										4.525 B3				
Fairless, Pa.	3.975 U1	4.825 U1				5.95 U1	7.275 U1					\$8.80 U1	\$7.50 U1	
New Haven, Conn.														
Phoenixville, Pa.														
Sparrows Pt., Md.	3.925 B3	4.775 B3	5.275 B3			5.90 B3	7.225 B3	8.075 B3		4.625 B3		\$8.80 B3	\$7.50 B3	
Worcester, Mass.										4.825 A5				
Trenton, N. J.														
Alton, Ill.										4.70 L1				
Ashland, Ky.	3.925 A7		5.275 A7	5.175 A7										
Carlton-Maxillion, Dever, Ohio			5.275 R1, R3							5.05 R1				
Chicago, Juliet, Ill.	3.925 A1, W8					5.90 U1				4.525 A5, N4, R3				
Sterling, Ill.										4.625 N4				
Cleveland, Ohio	3.925 J3, R3	4.775 J3, R3		5.175 R3		5.90 J3, R3	7.225 J3, R3			4.525 A5				
Detroit, Mich.	4.075 G3, M2	4.925 G3				6.05 G3	7.375 G3							
Newport, Ky.	3.925 N5													
Gary, Ind. Harbor, Indiana	3.925 J3, U1, Y1	4.775 J3, U1, Y1	5.275 U1, J3	5.175 J3, U1	5.675 U1	5.90 U1, J3 6.40 Y1	7.225 U1 7.725 Y1					\$8.70 J3, U1, Y1	\$7.40 J3, U1	6.10 U1, Y1
Granite City, Ill.	4.125 G2	4.975 G2	5.475 G2	5.375 G2									\$7.60 G2	6.30 G2
Kokomo, Ind.	4.025 C9		5.375 C9						5.025 C9	4.625 C9				
Mansfield, Ohio					5.675 E2				5.05 E2					
Middletown, Ohio		4.775 A7		5.175 A7	5.675 A7									
Niles, Ohio	3.925 S1	5.80 N3	5.275 N3	6.525 N3	5.45 S1	5.90 S1							\$7.40 R3	
Sharon, Pa.	5.175 N3			5.675 N3										
Pittsburgh, Pa.	3.925 J3, U1, P6, A7	4.775 J3, U1, P6	5.275 U1	5.175 U1		5.90 J3, U1	7.225 J3, U1	7.925 U1		4.525 A5 4.725 P6		\$8.70 J3, U1	\$7.40 J3, U1	6.10 U1 4
Butler, Pa.														
Portsmouth, Ohio	3.925 P7	4.775 P7								4.525 P7				
Wairton, Wheeling, Fellansbee, W. Va.	3.925 W3, W5	4.775 W3, W5, F3	5.275 W3, W5		5.675 W3, W5	5.90 W3	7.225 W3					\$8.70 W3, W5	\$7.40 W3, W5	6.10 F3, W5
Youngstown, Ohio	3.925 R3, U1, Y1	4.775 R3, Y1		5.175 Y1		5.90 U1, R3 6.40 Y1	7.225 R3 7.725 Y1			4.525 Y1		\$8.70 R3		
Fontana, Cal.	4.70 K1	5.875 K1				6.675 K1	8.275 K1			5.325 K1				
Genova, Utah	4.025 C7													
Kansas City, Mo.									4.775 C6	4.845 S2				
Los Angeles, Torrance, Cal.	4.625 C7		6.275 C7							5.325 B2				
Minneapolis, Colo.										4.775 C6				
San Francisco, Niles, Pittsburg, Cal.	4.625 C7	5.725 C7	6.025 C7							5.175 C7		\$9.45 C7	\$8.15 C7	
Seattle, Wash.														
Atlanta, Ga.														
Fairfield, Ala.	3.925 R3, T2	4.775 T2	5.275 R3, T2			5.90 T2				5.125 T2 5.225 R3	4.525 T2 R3	\$8.80 T2	\$7.50 T2	
Houston, Texas	4.325 S2									4.925 S2				4

May 27, 1954

## IRON AGE

STEEL  
PRICES(Effective  
May 25, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mil's. Bright
EAST	Bethlehem, Pa.				4.875 B3	6.325 B3	6.225 B3					
	Buffalo, N. Y.	4.15 B3 4.18 R3	4.15 B3,R3	5.25 B5	4.875 B3,R3	6.325 B3,B5	6.225 B3	4.10 B3			6.25 B3	5.525 W6
	Claymont, Del.							4.10 C4		5.55 C4		
	Coatesville, Pa.							4.10 L4		5.55 L4		
	Conshehocken, Pa.							4.10 A2	5.15 A2		6.25 A2	
	Harrisburg, Pa.							4.10 C3	5.15 C3			
	Hartford, Conn.			5.70 R3		6.775 R3						
	Johnstown, Pa.	4.15 B3	4.15 B3		4.875 B3		6.225 B3	4.10 B3		5.55 B3	6.25 B3	5.525 B3
	Fairless, Pa.	4.30 U1	4.30 U1		5.025 U1							
	Newark, N. J.			5.65 W10		6.65 W10						
	New Haven, Conn.											
	Camden, N. J.			5.65 P10		6.50 P10						
	Putnam, Conn.			5.75 W10								
	Sparrows Pt., Md.		4.15 B3					4.10 B3		5.55 B3	6.25 B3	5.625 B3
	Palmer, Worcester, Mansfield, Mass.			5.75 B5 6.10 W11		6.775 B5						5.825 A5, W6
	Roadville, Mass.			5.75 C14								
MIDDLE WEST	Alton, Ill.	4.35 L1										5.70 L1
	Ashland, Ky.							4.10 A7				
	Canton-Massillon, Ohio			5.20 R2 5.24 R3	4.875 R3,T5	6.325 R2,R3,T5						
	Chicago, Joliet, Ill.	4.15 U1, N4, W8 4.22 R3	4.15 R3,N4	5.20 A5,W10, W8,B5,L2	4.875 U1, W8,R3	6.325 A5,W8, W10,L2, R3,B5		4.10 U1,W8	5.15 U1	5.55 U1	6.25 U1	5.525 A1, R3,N4,W7
	Cleveland, Ohio	4.21 R3	4.15 R3	5.20 A5,C13		6.325 A5, C13		4.10 J3,R3	5.15 J3		6.25 J3	5.525 A5, R3,C13
	Detroit, Mich.	4.30 R5,G3		5.35 R5,P8 5.40 B5 5.45 P3	4.975 R5 5.025 G3	6.425 R5 6.475 P8 6.525 B5,P3	6.375 G3	4.25 G3			6.40 G3	
	Duluth, Minn.											5.525 A5
	Gary, Ind. Harbor, Crawfordsville	4.15 I3, U1, Y1	4.15 I3, U1, Y1	5.27 R3	4.875 I3, U1, Y1	6.325 R3,M5	6.225 U1,I3 6.725 Y1	4.10 I3, U1, Y1	5.15 I3	5.55 U1	6.25 U1,I3 6.75 Y1	5.625 M4
	Granite City, Ill.							4.30 G2				
	Kokomo, Ind.											5.625 C3
	Sterling, Ill.	4.25 N4	4.25 N4									5.625 N4
	Niles, Ohio Sharon, Pa.							4.10 S1		5.55 S1	6.25 S1	
	Pittsburgh, Pa. Midland, Pa.	4.15 J3, U1	4.15 J3, U1	5.20 A5,C8, J3,W10 5.26 R3	4.875 U1,C11	6.325 A5,C11, W10,C8	6.225 J3, U1	4.10 J3, U1	5.15 U1	5.55 U1	6.25 J3, U1	5.525 A5, J3,P6
	Portsmouth, Ohio											5.525 P1
	Weirton, Wheeling, Follansbee, W. Va.	4.15 W3						4.10 W3				
	Youngstown, Ohio	4.15 U1, Y1 4.20 R3	4.15 R3, U1, Y1	5.20 Y1,F2	4.875 U1, Y1, C10	6.325 Y1, C10,F2	6.225 U1 6.725 Y1	4.10 R3, U1, Y1			6.75 Y1	5.525 Y1
WEST	Emeryville, Cal.	4.90 J5	4.90 J5									
	Fontana, Cal.	4.85 K1	4.85 K1		5.925 K1		7.475 K1	4.75 K1		6.60 K1	6.95 K1	
	Geneva, Utah							4.10 C7			6.25 C7	
	Kansas City, Mo.	4.75 S2	4.75 S2		5.475 S2		6.825 S2					6.125 S2
	Los Angeles, Torrance, Cal.	4.85 B2,C7	4.85 B2,C7	6.65 R3 6.96 R3	5.925 B2		6.925 B2					6.475 B2
	Minnequa, Colo.	4.60 C6	4.75 C6					4.95 C6				5.775 C6
	Portland, Ore.	4.90 O2										
	San Francisco, Niles, Pittsburg, Cal.	4.85 C7,P9 4.90 B2	4.85 C7,P9 4.90 B2				6.975 B2					6.475 C7
	Seattle, Wash.	4.90 B2,N6	4.90 B2				6.975 B2	5.60 B2			7.15 B2	
	Atlanta, Ga.	4.35 A8	4.35 A8									5.725 A8
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	4.15 T2,C16 4.18 R3	4.15 R3,T2, C16				6.225 T2	4.10 R3,T2			6.25 T2	5.525 R3, T2
	Houston, Ft. Worth, Lone Star, Tex.	4.55 S2	4.55 S2		5.275 S2			4.50 L3,S2				5.925 S1



# Steel Prices

(Effective May 25, 1954)

## Key to Steel Producers

With Principal Offices

- A1 Arne Steel Co., Chicago  
 A2 Alan Wood Steel Co., Conahocken, Pa.  
 A3 Allegheny Ludlum Steel Corp., Pittsburgh  
 A4 American Cladmetals Co., Carnegie, Pa.  
 A5 American Steel & Wire Div., Cleveland  
 A6 Angell Nail & Chaplet Co., Cleveland  
 A7 Armco Steel Corp., Middletown, O.  
 A8 Atlantic Steel Co., Atlanta, Ga.  
 B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
 B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
 B3 Bethlehem Steel Co., Bethlehem, Pa.  
 B4 Blair Strip Steel Co., New Castle, Pa.  
 B5 Bliss & Laughlin, Inc., Harvey, Ill.  
 C1 Calstrip Steel Corp., Los Angeles  
 C2 Carpenter Steel Co., Reading, Pa.  
 C3 Central Iron & Steel Co., Harrisburg, Pa.  
 C4 Claymont Products Dept., Claymont, Del.  
 C5 Cold Metal Products Co., Youngstown  
 C6 Colorado Fuel & Iron Corp., Denver  
 C7 Columbia Geneva Steel Div., San Francisco  
 C8 Columbia Steel & Shafing Co., Pittsburgh  
 C9 Continental Steel Corp., Kokomo, Ind.  
 C10 Copperweld Steel Co., Pittsburgh, Pa.  
 C11 Crucible Steel Co. of America, New York  
 C12 Cumberland Steel Co., Cumberland, Md.  
 C13 Cryshoga Steel & Wire Co., Cleveland  
 C14 Compressed Steel Shafing Co., Readville, Mass.  
 C15 G. O. Carlson, Inc., Thorndale, Pa.  
 C16 Connors Steel Div., Birmingham  
 D1 Detroit Steel Corp., Detroit  
 D2 Detroit Tube & Steel Div., Detroit  
 D3 Driver Harris Co., Harrison, N. J.  
 D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
 E1 Eastern Stainless Steel Corp., Baltimore  
 E2 Empire Steel Co., Mansfield, O.  
 F1 Firth Sterling, Inc., McKeesport, Pa.  
 F2 Fitzsimmons Steel Corp., Youngstown  
 F3 Follansbee Steel Corp., Follansbee, W. Va.  
 G1 Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.  
 G3 Great Lakes Steel Corp., Detroit  
 G4 Greer Steel Co., Dover, O.  
 H1 Hanna Furnace Corp., Detroit  
 I2 Ingersoll Steel Div., Chicago  
 I3 Inland Steel Co., Chicago  
 I4 Interlake Iron Corp., Cleveland  
 J1 Jackson Iron & Steel Co., Jackson, O.  
 J2 Jessop Steel Corp., Washington, Pa.  
 J3 Jones & Laughlin Steel Corp., Pittsburgh  
 J4 Joslyn Mfg. & Supply Co., Chicago  
 J5 Judson Steel Corp., Emeryville, Calif.  
 K1 Kaiser Steel Corp., Fontana, Cal.  
 K2 Keystone Steel & Wire Co., Peoria  
 K3 Koppers Co., Granite City, Ill.  
 L1 Laclede Steel Co., St. Louis  
 L2 La Salle Steel Co., Chicago  
 L3 Lone Star Steel Co., Dallas  
 L4 Lukens Steel Co., Coatesville, Pa.  
 M1 Mahoning Valley Steel Co., Niles, O.  
 M2 McLouth Steel Corp., Detroit  
 M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
 M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.  
 M5 Monarch Steel Co., Inc., Hammond, Ind.  
 M6 Mystic Iron Works, Everett, Mass.  
 N1 National Supply Co., Pittsburgh  
 N2 National Tube Co., Pittsburgh  
 N3 Niles Rolling Mill Div., Niles, O.  
 N4 Northwestern Steel & Wire Co., Sterling, Ill.  
 N5 Newport Steel Corp., Newport, Ky.  
 N6 Northwest Steel Rolling Mills, Seattle  
 N7 Newman Crosby Steel Co., Pawtucket, R. I.  
 O1 Oliver Iron & Steel Co., Pittsburgh  
 O2 Oregon Steel Mills, Portland  
 P1 Page Steel & Wire Div., Monessen, Pa.  
 P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
 P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
 P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
 P5 Pittsburgh Screw & Bolt Co., Pittsburgh  
 P6 Pittsburgh Steel Co., Pittsburgh  
 P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit  
 P9 Pacific States Steel Co., Niles, Cal.  
 P10 Precision Drawn Steel Co., Camden, N. J.  
 P11 Production Steel Strip Corp., Detroit  
 R1 Reeves Steel & Mfg. Co., Dover, O.  
 R2 Reliance Div., Eaton Mfg. Co., Miamillon, O.  
 R3 Republic Steel Corp., Cleveland  
 R4 Roebbing Sons Co., John A., Trenton, N. J.  
 R5 Rotary Electric Steel Co., Detroit  
 R6 Rodney Metals, Inc., New Bedford, Mass.  
 R7 Rome Strip Steel Co., Rome, N. Y.  
 S1 Sharon Steel Corp., Sharon, Pa.  
 S2 Sheffield Steel Corp., Kansas City  
 S3 Shenango Furnace Co., Pittsburgh  
 S4 Simonds Saw & Steel Co., Fitchburg, Mass.  
 S5 Sloss Sheffield Steel & Iron Co., Birmingham  
 S6 Standard Forging Corp., Chicago  
 S7 Stanley Works, New Britain, Conn.  
 S8 Superior Drawn Steel Co., Monaca, Pa.  
 S9 Superior Steel Corp., Carnegie, Pa.  
 S10 Sweet's Steel Co., Williamsport, Pa.  
 T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
 T2 Tennessee Coal & Iron Div., Fairfield  
 T3 Tennessee Products & Chem. Corp., Nashville  
 T4 Thomas Strip Div., Warren, O.  
 T5 Temken Steel & Tube Div., Canton, O.  
 T6 Tremont Nail Co., Warcham, Mass.  
 T7 Texas Steel Co., Fort Worth  
 U1 United States Steel Corp., Pittsburgh  
 U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.  
 U3 Fred Ulbrich & Sons, Wallingford, Conn.  
 W1 Wallingford Steel Co., Wallingford, Conn.  
 W2 Washington Steel Corp., Washington, Pa.  
 W3 Weirton Steel Co., Weirton, W. Va.  
 W4 Wheatland Tube Co., Wheatland, Pa.  
 W5 Wheeling Steel Corp., Wheeling, W. Va.  
 W6 Wickwire Spencer Steel Div., Buffalo  
 W7 Wilson Steel & Wire Co., Chicago  
 W8 Wisconsin Steel Co., S. Chicago, Ill.  
 W9 Woodward Iron Co., Woodward, Ala.  
 W10 Wycoff Steel Co., Pittsburgh  
 W11 Worcester Pressed Steel Co., Worcester, Mass.  
 Y1 Youngstown Sheet & Tube Co., Youngstown

## PIPE AND TUBING

Base discounts (per) l.s.b. mills. Base price about \$200 per net ton.

	BUTTWELD														SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
<b>STANDARD T. &amp; C.</b>																						
Sparrows Pt. B3.....	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Youngstown R3.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana K1.....	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh J3.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Alton, Ill. L1.....	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Sharon M3.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fairless N2.....	24.25		27.25		29.75		32.25		32.75		33.25		34.75									
Pittsburgh N1.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling W5.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland W4.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown Y1.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor Y1.....	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain N2.....	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
<b>EXTRA STRONG</b>																						
<b>PLAIN ENDS</b>																						
Sparrows Pt. B3.....	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown R3.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana K1.....	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh J3.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. L1.....	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Sharon M3.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh N1.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling W5.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland W4.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown Y1.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor Y1.....	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain N2.....	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only butt weld and seamless, 2 1/4 pts. higher discount. Plain ends, butt weld and seamless, 3 in. and under, 4 1/2 pts. higher discount. Butt weld jobbers' discount, 5 pct. East St. Louis zinc price now 10.25¢.

# Steel Prices

(Effective May 25, 1954)

To identify producers, see Key on preceding page

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Ra.	Light Ra.	Joint Ra.	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Decatur U1	4.325	5.20	5.275				
So. Chicago R3				7.05			
Cleveland R3							
Enaley T2	4.325	5.20					
Fairfield T2	4.325	5.20		7.05		5.125	
Gary U1	4.325	5.20				5.125	
Ind. Harbor J3	4.325		5.275	7.05		5.125	
Johnstown B3	5.20						
Joliet U1	5.20	5.275					
Kansas City S2				7.30			11.00
Lackawanna B3	4.325	5.20	5.275		5.125		
Lebanon B3				7.05	10.50		11.00
Minnequa C6	4.325	5.70	5.275	7.05	5.125	11.00	
Pittsburgh O1					10.50	11.00	
Pittsburgh P5					10.50	11.00	
Pittsburgh J3				7.05			
Pitt'g, Cal. C7					5.275		
Seattle B7	4.325		5.275	7.55	5.275	11.50	
Steele B3					5.125		
Struthers Y1						5.275	
Terrace C7					5.275		
Youngstown R3				7.05			

## ELECTRICAL SHEETS

22-Gage	F.o.b. Mill Cents Per Lb.	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi-Processed	Fully Processed
Field			8.05	
Armature		8.15	8.40	8.90
Elect.		8.75	9.00	9.50
Motor		9.75	10.00	10.50
Dynamo		10.65	10.90	11.40
Trans. 72		11.60	11.85	12.35
Trans. 65		12.15	Grain Oriented	
Trans. 58		12.65	Trans. 80	16.25
Trans. 52		13.65	Trans. 73	16.75

Producing points: Beech Bottom (W5); Brackenridge (A5); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).  
\* Coils 75¢ higher.

## CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa., L4	*32.7	
Washington, Pa., J2		
Claymont, Del., C6		
New Castle, Ind., J2		32.50
Nickel-carbon		
10 pct. Coatesville, Pa., L4	37.5	
Inconel-carbon		
10 pct., Coatesville, Pa., L4	46.10	
Monel-carbon		
10 pct. Coatesville, Pa., L4	38.90	

\* Includes annealing and pickling, sandblasting.

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Col	Col	Col	Col	Col	Col	Col
	Standard & Coated Nails	Woven Wire	Fence 9-15 1/2 ga.	17 1/2" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbed Wire	Merch. Wire Ann'd
Alabama City R3	131	140		149	153	6.675	7.07
Aliquippa, Pa. J3	131	143			150	6.675	7.20
Atlanta A8	133	145		151	158	6.775	7.30
Bartonsville K2	133	145		151	158	6.775	7.30
Buffalo W6							
Chicago, Ill. N4	131	143		149	156	6.675	7.30
Cleveland A6	137						
Crawfordsville M4	133	145		151	153	6.775	7.325
Donora, Pa. A5	131	140		149	153	6.675	7.07
Duluth A5	131	140	145	149	153	6.675	7.07
Fairfield, Ala. T2	131	140		149	153	6.675	7.07
Galveston D4	139	148					
Houston S2	139	148			161	7.075	7.475
Johnstown, Pa. B5	131	143	145		156	6.675	7.225
Joliet, Ill. A5	131	140		149	153	6.675	7.07
Kokomo, Ind. C9	133	142		151	156	6.775	7.175
Los Angeles B2					7.625		
Kansas City S2	143	152		161	165	7.275	7.675
Minnequa C6	136	148	150	154	162	6.925	7.325
Monessen P6	131	145			157	6.675	7.225
Moline, Ill. R3			145				
Pittsburgh, Cal. C7	150	163		173	173	7.625	8.025
Portsmouth P7					8.075		
Rankin, Pa. A5	131	140			153	6.675	7.075
So. Chicago R3	131	140	145	149	153	6.675	7.075
S. San Francisco C8					173		
Sparrows Pt. B3	133			151	158	6.775	7.325
Struthers, O. Y1					6.675	7.175	
Worcester A5	137				6.975		
Williamsport, Pa. S10	133		158				

Cut Nails, carloads, base \$8.00 per keg (less 2¢ for jobbers), at Conshohocken, Pa. (A2).  
\* Alabama City and So. Chicago don't include zinc extra.  
Galvanized products computed with zinc at 11.0¢ per lb.

## WARE-HOUSES

		Base price, f.o.b., dollars per 100 lb.											
Cities	City Delivery Charge	Sheets		Strip		Plates	Shapes	Bars	Alloy Bars				
		Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A-4615 As rolled	Hot-Rolled A-4140 Annealed	Cold-Drawn A-4615 As rolled	Cold-Drawn A-4140 Annealed
Baltimore	.20	6.20	7.12	7.36	7.00		6.95	6.98	6.86	8.17			
Birmingham	.15	6.10	7.00	8.00	6.30		6.35	6.35	6.15	8.90			
Boston	.20	6.89	7.83	9.18	7.13	9.35	7.13	7.06	6.87	8.35	12.40	11.94	14.55
Buffalo	.20	6.18	7.15	8.70	6.65		6.65	6.55	6.35	7.70		12.28	14.58
Chicago	.20	6.18	7.12	7.95	6.42		6.68	6.59				12.15	14.55
Cincinnati	.20	6.30	7.11		6.66		6.33	6.46	6.28	7.30		11.60	14.05
Cleveland	.20	6.18	7.12	8.25	6.58		6.62	6.93	6.52	7.60		11.85	14.30
Denver		7.95	8.85	10.45	8.20	9.55	6.50	6.79	6.34	7.40	12.04	11.74	14.29
Detroit	.20	6.35	7.29	8.42	6.69	7.36	6.80	6.91	6.56	7.60	12.47	11.92	14.42
Houston	.20	6.45	7.31		7.71		6.93						14.62
Kansas City	.20	7.15	7.45	9.23	7.45		7.20	7.35	7.45	9.30		12.80	
Los Angeles	.20	6.85			7.09		7.00	7.13	6.95	8.07		9.40	
Memphis	.10											8.07	
Milwaukee	.20	6.79	7.69		6.90		7.01	7.09	6.88	7.89		8.76	
New Orleans	.15	6.51	7.41		6.63		6.50	6.63	6.45	7.57		11.77	14.22
New York	.30	6.78	7.75	8.37	7.16	9.15	6.99	6.90	7.06	8.43	12.29	11.99	14.54
Norfolk	.20	6.90		8.41			7.00	7.00	7.00	8.50			
Philadelphia	.25	6.35	7.13	7.87	7.02		6.63	6.67	6.87	8.19		11.74	14.19
Pittsburgh	.20	6.53	7.12	8.00	6.55		6.33	6.46	6.28	7.65		11.60	14.05
Portland	.10	7.60	8.45	9.05	7.65		7.30	7.25	7.35	10.65			
Salt Lake City	.20	8.75	9.75	10.50	9.25		8.10	8.25	9.20	11.25			
San Francisco	.20	8.60	10.50				7.20	7.25	7.15	9.75		12.90	15.90
Seattle	.20	7.95	9.30	9.80	7.80		7.40	7.30	7.40	10.45		13.15	15.60
St. Louis	.20	8.15	9.50		8.00		7.60	7.50	7.60	10.65			
St. Paul	.15	6.48	7.42	8.25	6.72	7.70	6.73	6.86	6.58	7.70	12.20	11.90	14.45
			8.33	8.53									14.35

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.  
Exceptions: (\*) 500 to 1499 lb. (\*) 20,000 lb or over. (\*) 450 to 1499 lb. (\*) 500 to 9999 lb. (\*) 1000 lb or over. (\*) 400 to 1499 lb. (\*) 1500 to 3499 lb. (\*) 2000 to 5999 lb.

## C-R SPRING STEEL

		CARBON CONTENT				
Cents Per Lb F.o.b. Mill		0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. S7*	5.75	7.65	8.60	10.55	12.85	
Carnegie, Pa. S9		7.65	8.60	10.55	12.85	
Cleveland A5	5.45	7.65	8.60	10.55	12.85	
Detroit D1	5.65	7.85	8.80	10.55		
Detroit D2	5.60	7.85	8.80			
Harrison, N. J. C11		8.90	10.85	13.15		
Indianapolis C3	5.60	7.80	8.60	10.55		
New Castle, Pa. B4	5.80	8.00	8.60			
New Haven, Conn. D1	5.90	7.95	8.90	10.85		
Riverdale, Ill. A1	5.70	7.80	8.75	10.70	13.00	
Buffalo, N. Y. R7	5.45	7.65	8.60	10.55	12.85	
Sharon, Pa. S1	5.45	7.65	8.60	10.55	12.85	
Trenton R4		7.95	8.90	10.85	13.15	
Wallingford W1	6.20	7.95	8.90	10.85	13.15	
Warren, Ohio T4	5.45	7.65	8.60	10.55	12.85	
Weirton, W. Va. W3	5.45	7.65	8.60	10.55	12.85	
Worcester, Mass. A5	6.30	7.95	8.90	10.85	13.15	
Youngstown C3	5.45	7.65	8.60	10.55		

\* Sold on Pittsburgh base.

## BOILER TUBES

		Size		Seamless		Elec. Weld	
\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill		OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	27.34	32.98	26.51	31.99	
	2 1/2	12	36.82	44.41	35.70	43.07	
	3	12	42.52	51.28	41.23	49.73	
	3 1/2	11	49.63	59.87	48.13	58.04	
	4	10	65.91	79.50	63.92	77.10	
National Tube	2	13		32.98	26.51		
	2 1/2	12	36.82	44.41	35.70		
	3	12	42.52	51.28	41.23		
	3 1/2	11	49.63	59.87	48.13		
	4	10	65.91	79.50	63.92		
Pittsburgh Steel	2	13	27.34	32.98			
	2 1/2	12	36.82	44.41			
	3	12	42.52	51.28			
	3 1/2	11	49.63	59.87			
	4	10	65.91	79.50			





# Ferroalloy Prices

(Effective May 25, 1954)

## Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered.  
65-72 Cr, 2% max. Si.  
0.025% C ... 34.50 0.20% C ... 33.50  
0.06% C ... 34.50 0.50% C ... 33.25  
0.10% C ... 34.00 1.00% C ... 33.00  
0.15% C ... 33.75 2.00% C ... 32.75  
65-69% Cr, 4.9% C ... 24.75  
62-66% Cr, 4.6% C, 6-9% Si ... 25.60

## S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.  
High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.  
Carloads ... 25.85  
Ton lots ... 23.00  
Less ton lots ... 29.50

## High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

## Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.  
0.10% max. C ... \$1.18  
0.50% max. C ... 1.14  
9 to 11% C ... 1.11

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)  
Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

## Calcium-Silicon

Contract price per lb of alloy, lump, delivered.  
30-33% Cr, 60-65% Si, 3.00 max. Fe.  
Carloads ... 19.00  
Ton lots ... 22.10  
Less ton lots ... 23.60

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy lump, delivered.  
16-20% Ca, 14-18% Mn, 53-59% Si.  
Carloads ... 20.00  
Ton lots ... 22.30  
Less ton lots ... 23.30

## SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.  
Ton lots ... 17.50  
Less ton lots ... 19.50

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.  
Carload lots ... 16.60  
Ton lots ... 18.10  
Less ton lots ... 19.35

## Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.  
Carload packed ... 17.50  
Ton lots to carload packed ... 18.50  
Less ton lots ... 20.00

## Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 75 pct Mn:  
Cents per-lb  
Producing Point  
Marietta, Ashtabula, O.; Alloy,  
W. Va.; Sheffield, Ala.; Portland,  
Ore. ... 10.00  
Clairton, Pa. ... 10.00  
Sheridan, Pa. ... 10.00  
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.  
Briquets, delivered, 66 pct Mn:  
Carloads, bulk ... 12.50  
Ton lots, packed ... 14.05

## Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.  
Manganese Silicon  
16 to 19% 3% max. ... \$34.00  
19 to 21% 3% max. ... 36.00  
21 to 23% 3% max. ... 38.50  
23 to 25% 3% max. ... 41.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered  
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.  
Carload, packed ... 36.95  
Ton lots ... 32.45

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
Carloads ... 30.00  
Ton lots ... 32.00  
250 to 1999 lb ... 34.00  
Less than 250 lb ... 37.00  
Premium for hydrogen-removed metal ... 1.50

## Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 21.35¢

## Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.  
Carloads Ton Less  
0.07% max. C, 0.06% P, 90% Mn ... 30.00 31.85 33.05  
0.07% max. C ... 27.95 29.80 31.00  
0.15% max. C ... 27.45 29.30 30.50  
0.30% max. C ... 26.95 28.80 30.00  
0.50% max. C ... 26.45 28.30 29.50  
0.75% max. C, 80-85% Mn, 5.0-7.0% Si ... 23.45 25.30 26.50

## Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢.  
Carload bulk ... 11.00  
Ton lots ... 12.65  
Briquet contract basis carlots, bulk, delivered, per lb of briquet ... 12.65  
Ton lots, packed ... 14.25

## Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$89.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.46 for each 0.50% Mn over 1%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.  
Ton Lots Carloads  
96% Si, 2% Fe ... 20.10 18.00  
97% Si, 1% Fe ... 20.60 18.50

## Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 2 lb Si briquets.  
Carloads, bulk ... 6.30  
Ton lots ... 7.90

## Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.  
25% Si ... 10.00 75% Si ... 13.80  
50% Si ... 10.80 85% Si ... 15.55  
65% Si ... 12.20 90.95% Si ... 17.00

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.  
Cast Turnings Distilled  
Ton lots ... \$2.05 \$2.95 \$3.75  
Less ton lots ... 2.40 3.30 4.55

## Ferrovandium

35-55% contract, basis, delivered, per pound, contained V.  
Openhearth ... \$3.00-\$3.10  
Crucible ... 3.10-3.20  
High speed steel (Primos) ... 3.20-3.25

Alsilfer, 20% Al, 40% Si, 40% Fe, contract basis f.o.b. Suspension Bridge, N. Y., per lb.  
Carloads ... 9.25¢  
Ton lots ... 10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langloeth, Pa., per pound contained Mo ... \$1.15

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.  
Ton lots ... \$3.50  
Less ton lots ... 9.55

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta ... \$4.75

Ferromolybdenum, 55-75%, f.o.b. Langloeth, Pa., per pound contained Mo ... \$1.30

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton ... \$90.00  
10 tons to less carload ... \$110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.30

Ferrotitanium, 25% low carbon, 0.16% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.50  
Less ton lots ... 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... \$177.00

Ferrotungsten, ¼ x down packed, per pound contained W. ton lots, f.o.b. ... \$2.30

Molybdc oxide, briquets or cans, per lb contained Mo, f.o.b. Langloeth, Pa. ... \$1.14  
bags, f.o.b. Washington, Pa., Langloeth, Pa. ... \$1.19

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound ... 14.50

Carload, bulk lump ... 15.75¢  
Ton lots, bulk lump ... 16.25¢  
Less ton lots, lump ... 16.50¢

Vanadium Pentoxide, 86-89% V<sub>2</sub>O<sub>5</sub>, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> ... \$1.30

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.  
Ton lots ... \$1.00

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.  
Carload, bulk ... 1.00

Boron Agents  
Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4% Si, 40-45%, per lb contained B ... \$1.30

Bortam, f.o.b. Niagara Falls  
Ton lots, per pound ... 50¢  
Less ton lots, per pound ... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.  
Ton lots per pound ... 10.00

Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ... \$1.30  
F.o.b. Wash., Pa.; 100 lb up ... 1.30  
10 to 14% B ... 1.50  
14 to 19% B ... 1.50  
19% min. B ... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over  
No. 1 ... \$1.00  
No. 6 ... 50¢  
No. 79 ... 50¢

Manganase-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.  
Ton lots ... \$1.40  
Less ton lots ... 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered  
Less ton lots ... \$2.00

Silicaz, contract basis, delivered  
Ton lots ... 45.00